

Sequence Listing

(1) GENERAL INFORMATION

(i) APPLICANT: Meltzer and Trent

(ii) TITLE OF INVENTION: AIB1, A NOVEL RECEPTOR CO-ACTIVATOR
AMPLIFIED IN CANCER

(iii) NUMBER OF SEQUENCES: 12

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: Klarquist Sparkman Campbell Leigh & Whinston, LLP

(B) STREET: One World Trade Center

121 S.W. Salmon Street, Suite 1600

(C) CITY: Portland

(D) STATE: Oregon

(E) COUNTRY: United States of America

(F) ZIP: 97204-2988

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Disk, 3-1/2 inch

(B) COMPUTER: IBM PC compatible

(C) OPERATING SYSTEM: Widows NT

(D) SOFTWARE: WordPerfect 7.0 & ASCII

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER:

(B) FILING DATE:

(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER:

(B) FILING DATE:

(C) CLASSIFICATION:

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: William D. Noonan, M.D.

(B) REGISTRATION NUMBER: 30,878

(C) REFERENCE/DOCKET NUMBER: 4239-49944

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: (503) 226-7391

(B) TELEFAX: (503) 228-9446

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6837 nucleotides; 1419 amino acid residues

(B) TYPE: Human DNA & Amino Acid

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

CG GCG GCG GCT GCG GCT TAG TCG GTG GCG GCC GGC GGC TGC GGG CTG AGC GGC
1 5 10 15
GAG TTT CCG ATT TAA AGC TGA GCT GCG AGG AAA ATG GCG GCG GGA GGA TCA AAA TAC
20 25 30 35

| | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | TTG | CTG | GAT | GGT | GGA | CTC | AGA | GAC | CAA | TAA | AAA | TAA | ACT | GCT | TGA | ACA | TCC | TTT | GAC |
| | 40 | | | | | | 45 | | | | | 50 | | | | | 55 | | |
| | TGG | TTA | GCC | AGT | TGC | TGA | TGT | ATA | TTC | AAG | ATG | AGT | GGA | TTA | GGA | GAA | AAC | TTG | GAT |
| | | | | | | | | | | Met | Ser | Gly | Leu | Gly | Glu | Asn | Leu | Asp | |
| 5 | | | 60 | | | | 65 | | | | | 70 | | | | | 75 | | |
| | CCA | CTG | GCC | AGT | GAT | TCA | CGA | AAA | CGC | AAA | TTG | CCA | TGT | GAT | ACT | CCA | GGA | CAA | GGT |
| | Pro | Leu | Ala | Ser | Asp | Ser | Arg | Lys | Arg | Lys | Leu | Pro | Cys | Asp | Thr | Pro | Gly | Gln | Gly |
| | | | 80 | | | | | | 85 | | | | | | 90 | | | 95 | |
| 10 | CTT | ACC | TGC | AGT | GGT | GAA | AAA | CGG | AGA | CGG | GAG | CAG | GAA | AGT | AAA | TAT | ATT | GAA | GAA |
| | Leu | Thr | Cys | Ser | Gly | Glu | Lys | Arg | Arg | Arg | Glu | Gln | Glu | Ser | Lys | Tyr | Ile | Glu | Glu |
| | | | | | 100 | | | | | 105 | | | | | 110 | | | | |
| | TTG | GCT | GAG | CTG | ATA | TCT | GCC | AAT | CTT | AGT | GAT | ATT | GAC | AAT | TTC | AAT | GTC | AAA | CCA |
| | Leu | Ala | Glu | Leu | Ile | Ser | Ala | Asn | Leu | Ser | Asp | Ile | Asp | Asn | Phe | Asn | Val | Lys | Pro |
| | 115 | | | | 120 | | | | | 125 | | | | | 130 | | | | |
| 15 | GAT | AAA | TGT | GCG | ATT | TTA | AAG | GAA | ACA | GTA | AGA | CAG | ATA | CGT | CAA | ATA | AAA | GAG | CAA |
| | Asp | Lys | Cys | Ala | Ile | Leu | Lys | Glu | Thr | Val | Arg | Gln | Ile | Arg | Gln | Ile | Lys | Glu | Gln |
| | 135 | | | | 140 | | | | | 145 | | | | | 150 | | | | |
| | GGA | AAA | ACT | ATT | TCC | AAT | GAT | GAT | GAT | GTT | CAA | AAA | GCC | GAT | GTA | TCT | TCT | ACA | GGG |
| | Gly | Lys | Thr | Ile | Ser | Asn | Asp | Asp | Asp | Val | Gln | Lys | Ala | Asp | Val | Ser | Ser | Thr | Gly |
| | | | 155 | | | | | 160 | | | | | 165 | | | | | 170 | |
| 20 | CAG | GGA | GTT | ATT | GAT | AAA | GAC | TCC | TTA | GGA | CCG | CTT | TTA | CTT | CAG | GCA | TTG | GAT | GGT |
| | Gln | Gly | Val | Ile | Asp | Lys | Asp | Ser | Leu | Gly | Pro | Leu | Leu | Leu | Gln | Ala | Leu | Asp | Gly |
| | | | 175 | | | | | 180 | | | | | 185 | | | | | 190 | |
| 25 | TTC | CTA | TTT | GTG | GTG | AAT | CGA | GAC | GGA | AAC | ATT | GTA | TTT | GTA | TCA | GAA | AAT | GTC | ACA |
| | Phe | Leu | Phe | Val | Val | Asn | Arg | Asp | Gly | Asn | Ile | Val | Phe | Val | Ser | Glu | Asn | Val | Thr |
| | | | | 195 | | | | 200 | | | | | 205 | | | | | | |
| | CAA | TAC | CTG | CAA | TAT | AAG | CAA | GAG | GAC | CTG | GTT | AAC | ACA | AGT | GTT | TAC | AAT | ATC | TTA |
| | Gln | Tyr | Leu | Gln | Tyr | Lys | Gln | Glu | Asp | Leu | Val | Asn | Thr | Ser | Val | Tyr | Asn | Ile | Leu |
| | 210 | | | 215 | | | | | | 220 | | | | | 225 | | | | |
| 30 | CAT | GAA | GAA | GAC | AGA | AAG | GAT | TTT | CTT | AAG | AAT | TTA | CCA | AAA | TCT | ACA | GTT | AAT | GGA |
| | His | Glu | Glu | Asp | Arg | Lys | Asp | Phe | Leu | Lys | Asn | Leu | Pro | Lys | Ser | Thr | Val | Asn | Gly |
| | 230 | | | 235 | | | | | | 240 | | | | | 245 | | | | |
| | GTT | TCC | TGG | ACA | AAT | GAG | ACC | CAA | AGA | CAA | AAA | AGC | CAT | ACA | TTT | AAT | TGC | CGT | ATG |
| | Val | Ser | Trp | Thr | Asn | Glu | Thr | Gln | Arg | Gln | Lys | Ser | His | Thr | Phe | Asn | Cys | Arg | Met |
| | | | 250 | | | | 255 | | | | | 260 | | | 265 | | | | |
| 35 | TTG | ATG | AAA | ACA | CCA | CAT | GAT | ATT | CTG | GAA | GAC | ATA | AAC | GCC | AGT | CCT | GAA | ATG | CGC |
| | Leu | Met | Lys | Thr | Pro | His | Asp | Ile | Leu | Glu | Asp | Ile | Asn | Ala | Ser | Pro | Glu | Met | Arg |
| | | | 270 | | | | 275 | | | | | | 280 | | | | | 285 | |
| 40 | CAG | AGA | TAT | GAA | ACA | ATG | CAG | TGC | TTT | GCC | CTG | TCT | CAG | CCA | CGA | GCT | ATG | ATG | GAG |
| | Gln | Arg | Tyr | Glu | Thr | Met | Gln | Cys | Phe | Ala | Leu | Ser | Gln | Pro | Arg | Ala | Met | Met | Glu |
| | | | | 290 | | | | 295 | | | | | 300 | | | | | | |
| | GAA | GGG | GAA | GAT | TTG | CAA | TCT | TGT | ATG | ATC | TGT | GTG | GCA | CGC | CGC | ATT | ACT | ACA | GGA |
| | Glu | Gly | Glu | Asp | Leu | Gln | Ser | Cys | Met | Ile | Cys | Val | Ala | Arg | Arg | Ile | Thr | Thr | Gly |
| | 305 | | | 310 | | | | | | 315 | | | | | 320 | | | | |
| 45 | GAA | AGA | ACA | TTT | CCA | TCA | AAC | CCT | GAG | AGC | TTT | ATT | ACC | AGA | CAT | GAT | CTT | TCA | GGA |
| | Glu | Arg | Thr | Phe | Pro | Ser | Asn | Pro | Glu | Ser | Phe | Ile | Thr | Arg | His | Asp | Leu | Ser | Gly |
| | 325 | | | 330 | | | | 335 | | | | | 340 | | | | | | |
| | AAG | GTT | GTC | AAT | ATA | GAT | ACA | AAT | TCA | CTG | AGA | TCC | TCC | ATG | AGG | CCT | GGC | TTT | GAA |
| | Lys | Val | Val | Asn | Ile | Asp | Thr | Asn | Ser | Leu | Arg | Ser | Ser | Met | Arg | Pro | Gly | Phe | Glu |
| | | | 345 | | | | 350 | | | | | 355 | | | | | | 360 | |
| 50 | GAT | ATA | ATC | CGA | AGG | TGT | ATT | CAG | AGA | TTT | TTT | AGT | CTA | AAT | GAT | GGG | CAG | TCA | TGG |
| | Asp | Ile | Ile | Arg | Arg | Cys | Ile | Gln | Arg | Phe | Phe | Ser | Leu | Asn | Asp | Gly | Gln | Ser | Trp |
| | | | | 365 | | | | 370 | | | | | 375 | | | | | | 380 |
| 55 | TCC | CAG | AAA | CGT | CAC | TAT | CAA | GAA | GCT | TAT | CTT | AAT | GGC | CAT | GCA | GAA | ACC | CCA | GTA |
| | Ser | Gln | Lys | Arg | His | Tyr | Gln | Glu | Ala | Tyr | Leu | Asn | Gly | His | Ala | Glu | Thr | Pro | Val |
| | | | | 385 | | | | 390 | | | | | 395 | | | | | | |
| | TAT | CGA | TTC | TCG | TTG | GCT | GAT | GGA | ACT | ATA | GTG | ACT | GCA | CAG | ACA | AAA | AGC | AAA | CTC |
| | Tyr | Arg | Phe | Ser | Leu | Ala | Asp | Gly | Thr | Ile | Val | Thr | Ala | Gln | Thr | Lys | Ser | Lys | Leu |
| | 400 | | | | 405 | | | | | 410 | | | | | 415 | | | | |
| 60 | | | | | | | | | | | | | | | | | | | |
| | TTT | CGA | AAT | CCT | GTA | ACA | AAT | GAT | CGA | CAT | GGC | TTT | GTC | TCA | ACC | CAC | TTT | CTT | CAG |
| | Phe | Arg | Asn | Pro | Val | Thr | Asn | Asp | Arg | His | Gly | Phe | Val | Ser | Thr | His | Phe | Leu | Gln |
| | 420 | | | | 425 | | | | | | 430 | | | | | | 435 | | |
| 65 | AGA | GAA | CAG | AAT | GGA | TAT | AGA | CCA | AAC | CCA | AAT | CCT | GTT | GGA | CAA | GGG | ATT | AGA | CCA |
| | Arg | Glu | Gln | Asn | Gly | Tyr | Arg | Pro | Asn | Pro | Asn | Pro | Val | Gly | Gln | Gly | Ile | Arg | Pro |
| | 440 | | | | 445 | | | | | | 450 | | | | | | 455 | | |
| | CCT | ATG | GCT | GGA | TGC | AAC | AGT | TCG | GTA | GGC | GGC | ATG | AGT | ATG | TCG | CCA | AAC | CAA | GGC |
| | Pro | Met | Ala | Gly | Cys | Asn | Ser | Ser | Val | Gly | Gly | Met | Ser | Met | Ser | Pro | Asn | Gln | Gly |
| | | | 460 | | | | 465 | | | | | 470 | | | | | | 475 | |
| 70 | TTA | CAG | ATG | CCG | AGC | AGC | AGG | GCC | TAT | GGC | TTG | GCA | GAC | CCT | AGC | ACC | ACA | GGG | CAG |
| | Leu | Gln | Met | Pro | Ser | Ser | Arg | Ala | Tyr | Gly | Leu | Ala | Asp | Pro | Ser | Thr | Thr | Gly | Gln |

| | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | 480 | | | | | 485 | | | | | 490 | | | | | |
| | ATG | AGT | GGA | GCT | AGG | TAT | GGG | GGT | TCC | AGT | AAC | ATA | GCT | TCA | TTG | ACC | CCT | GGG | CCA |
| | Met | Ser | Gly | Ala | Arg | Tyr | Gly | Gly | Ser | Ser | Asn | Ile | Ala | Ser | Leu | Thr | Pro | Gly | Pro |
| 5 | 495 | | | | 500 | | | | | 505 | | | | | 510 | | | | |
| | GGC | ATG | CAA | TCA | CCA | TCT | TCC | TAC | CAG | AAC | AAC | AAC | TAT | GGG | CTC | AAC | ATG | AGT | AGC |
| | Gly | Met | Gln | Ser | Pro | Ser | Ser | Tyr | Gln | Asn | Asn | Asn | Tyr | Gly | Leu | Asn | Met | Ser | Ser |
| | 515 | | | | | 520 | | | | 525 | | | | | 530 | | | | |
| 10 | CCC | CCA | CAT | GGG | AGT | CCT | GGT | CTT | GCC | CCA | AAC | CAG | CAG | AAT | ATC | ATG | ATT | TCT | CCT |
| | Pro | Pro | His | Gly | Ser | Pro | Gly | Leu | Ala | Pro | Asn | Gln | Gln | Asn | Ile | Met | Ile | Ser | Pro |
| | 535 | | | | | 540 | | | | 545 | | | | | 550 | | | | |
| | CGT | AAT | CGT | GGG | AGT | CCA | AAG | ATA | GCC | TCA | CAT | CAG | TTT | TCT | CCT | GTT | GCA | GGT | GTG |
| | Arg | Asn | Arg | Gly | Ser | Pro | Lys | Ile | Ala | Ser | His | Gln | Phe | Ser | Pro | Val | Ala | Gly | Val |
| | 555 | | | | | 560 | | | | 565 | | | | | 570 | | | | |
| 15 | CAC | TCT | CCC | ATG | GCA | TCT | TCT | GGC | AAT | ACT | GGG | AAC | CAC | AGC | TTT | TCC | AGC | AGC | TCT |
| | His | Ser | Pro | Met | Ala | Ser | Ser | Gly | Asn | Thr | Gly | Asn | His | Ser | Phe | Ser | Ser | Ser | Ser |
| | 575 | | | | | 580 | | | | | | | | 585 | | | | | |
| | CTC | AGT | GCC | CTG | CAA | GCC | ATC | AGT | GAA | GGT | GTG | GGG | ACT | TCC | CTT | TTA | TCT | ACT | CTG |
| | Leu | Ser | Ala | Leu | Gln | Ala | Ile | Ser | Glu | Gly | Val | Gly | Thr | Ser | Leu | Leu | Ser | Thr | Leu |
| | 590 | | | | 595 | | | | | 600 | | | | | 605 | | | | |
| 20 | TCA | TCA | CCA | GGC | CCC | AAA | TTG | GAT | AAC | TCT | CCC | AAT | ATG | AAT | ATT | ACC | CAA | CCA | AGT |
| | Ser | Ser | Pro | Gly | Pro | Lys | Leu | Asp | Asn | Ser | Pro | Asn | Met | Asn | Ile | Thr | Gln | Pro | Ser |
| | 610 | | | | 615 | | | | | 620 | | | | | 625 | | | | |
| | AAA | GTA | AGC | AAT | CAG | GAT | TCC | AAG | AGT | CCT | CTG | GGC | TTT | TAT | TGC | GAC | CAA | AAT | CCA |
| | Lys | Val | Ser | Asn | Gln | Asp | Ser | Lys | Ser | Pro | Leu | Gly | Phe | Tyr | Cys | Asp | Gln | Asn | Pro |
| | 630 | | | | 635 | | | | | 640 | | | | | 645 | | | | |
| 25 | GTG | GAG | AGT | TCA | ATG | TGT | CAG | TCA | AAT | AGC | AGA | GAT | CAC | CTC | AGT | GAC | AAA | GAA | AGT |
| | Val | Glu | Ser | Ser | Met | Cys | Gln | Ser | Asn | Ser | Arg | Asp | His | Leu | Ser | Asp | Lys | Glu | Ser |
| | 650 | | | | 655 | | | | | 660 | | | | | 665 | | | | |
| 30 | AAG | GAG | AGC | AGT | GTT | GAG | GGG | GCA | GAG | AAT | CAA | AGG | GGT | CCT | TTG | GAA | AGC | AAA | GGT |
| | Lys | Glu | Ser | Ser | Val | Glu | Gly | Ala | Glu | Asn | Gln | Arg | Gly | Pro | Leu | Glu | Ser | Lys | Gly |
| | 670 | | | | 675 | | | | | 680 | | | | | 685 | | | | |
| | CAT | AAA | AAA | TTA | CTG | CAG | TTA | CTT | ACC | TGT | TCT | TCT | GAT | GAC | CGG | GGT | CAT | TCC | TCC |
| | His | Lys | Lys | Leu | Leu | Gln | Leu | Leu | Thr | Cys | Ser | Ser | Asp | Asp | Arg | Gly | His | Ser | Ser |
| | 685 | | | | 690 | | | | | 695 | | | | | 700 | | | | |
| 35 | TTG | ACC | AAC | TCC | CCC | CTA | GAT | TCA | AGT | TGT | AAA | GAA | TCT | TCT | GTT | AGT | GTC | ACC | AGC |
| | Leu | Thr | Asn | Ser | Pro | Leu | Asp | Ser | Ser | Cys | Lys | Glu | Ser | Ser | Val | Ser | Val | Thr | Ser |
| | 705 | | | | 710 | | | | | 715 | | | | | 720 | | | | |
| 40 | CCC | TCT | GGA | GTC | TCC | TCC | TCT | ACA | TCT | GGA | GGA | GTA | TCC | TCT | ACA | TCC | AAT | ATG | CAT |
| | Pro | Ser | Gly | Val | Ser | Ser | Ser | Thr | Ser | Gly | Gly | Val | Ser | Ser | Thr | Ser | Asn | Met | His |
| | 725 | | | | 730 | | | | | 735 | | | | | 740 | | | | |
| | GGG | TCA | CTG | TTA | CAA | GAG | AAG | CAC | CGG | ATT | TTG | CAC | AAG | TTG | CTG | CAG | AAT | GGG | AAT |
| | Gly | Ser | Leu | Leu | Gln | Glu | Lys | His | Arg | Ile | Leu | His | Lys | Leu | Leu | Gln | Asn | Gly | Asn |
| | 745 | | | | 750 | | | | | 755 | | | | | 760 | | | | |
| 45 | TCA | CCA | GCT | GAG | GTA | GCC | AAG | ATT | ACT | GCA | GAA | GCC | ACT | GGG | AAA | GAC | ACC | AGC | AGT |
| | Ser | Pro | Ala | Glu | Val | Ala | Lys | Ile | Thr | Ala | Glu | Ala | Thr | Gly | Lys | Asp | Thr | Ser | Ser |
| | 765 | | | | 770 | | | | | 775 | | | | | 780 | | | | |
| | ATA | ACT | TCT | TGT | GGG | GAC | GGA | AAT | GTT | GTC | AAG | CAG | GAG | CAG | CTA | AGT | CCT | AAG | AAG |
| | Ile | Thr | Ser | Cys | Gly | Asp | Gly | Asn | Val | Val | Lys | Gln | Glu | Gln | Leu | Ser | Pro | Lys | Lys |
| | 785 | | | | 790 | | | | | 795 | | | | | 800 | | | | |
| 50 | AAG | GAG | AAT | AAT | GCA | CTT | CTT | AGA | TAC | CTG | CTG | GAC | AGG | GAT | GAT | CCT | AGT | GAT | GCA |
| | Lys | Glu | Asn | Asn | Ala | Leu | Leu | Arg | Tyr | Leu | Leu | Asp | Arg | Asp | Asp | Pro | Ser | Asp | Ala |
| | 805 | | | | 810 | | | | | 815 | | | | | | | | | |
| 55 | CTC | TCT | AAA | GAA | CTA | CAG | CCC | CAA | GTG | GAA | GGA | GTG | GAT | AAT | AAA | ATG | AGT | CAG | TGC |
| | Leu | Ser | Lys | Glu | Leu | Gln | Pro | Gln | Val | Glu | Gly | Val | Asp | Asn | Lys | Met | Ser | Gln | Cys |
| | 820 | | | | 825 | | | | | 830 | | | | | 835 | | | | |
| | ACC | AGC | TCC | ACC | ATT | CCT | AGC | TCA | AGT | CAA | GAG | AAA | GAC | CCT | AAA | ATT | AAG | ACA | GAG |
| | Thr | Ser | Ser | Thr | Ile | Pro | Ser | Ser | Ser | Gln | Glu | Lys | Asp | Pro | Lys | Ile | Lys | Thr | Glu |
| | 840 | | | | 845 | | | | | 850 | | | | | 855 | | | | |
| 60 | ACA | AGT | GAA | GAG | GGA | TCT | GGA | GAC | TTG | GAT | AAT | CTA | GAT | GCT | ATT | CTT | GGT | GAT | CTG |
| | Thr | Ser | Glu | Glu | Gly | Ser | Gly | Asp | Leu | Asp | Asn | Leu | Asp | Ala | Ile | Leu | Gly | Asp | Leu |
| | 860 | | | | 865 | | | | | 870 | | | | | 875 | | | | |
| | ACT | AGT | TCT | GAC | TTT | TAC | AAT | AAT | TCC | ATA | TCC | TCA | AAT | GGT | AGT | CAT | CTG | GGG | ACT |
| | Thr | Ser | Ser | Asp | Phe | Tyr | Asn | Asn | Ser | Ile | Ser | Ser | Asn | Gly | Ser | His | Leu | Gly | Thr |
| | 880 | | | | 885 | | | | | 890 | | | | | 895 | | | | |
| 65 | AAG | CAA | CAG | GTG | TTT | CAA | GGA | ACT | AAT | TCT | CTG | GGT | TTG | AAA | AGT | TCA | CAG | TCT | GTG |
| | Lys | Gln | Gln | Val | Phe | Gln | Gly | Thr | Asn | Ser | Leu | Gly | Leu | Lys | Ser | Ser | Gln | Ser | Val |
| | 900 | | | | 905 | | | | | 910 | | | | | 915 | | | | |
| 70 | CAG | TCT | ATT | CGT | CCT | CCA | TAT | AAC | CGA | GCA | GTG | TCT | CTG | GAT | AGC | CCT | GTT | TCT | GTT |
| | Gln | Ser | Ile | Arg | Pro | Pro | Tyr | Asn | Arg | Ala | Val | Ser | Leu | Asp | Ser | Pro | Val | Ser | Val |
| | 915 | | | | 920 | | | | | 925 | | | | | 930 | | | | |

GGC TCA AGT CCT CCA GTA AAA AAT ATC AGT GCT TTC CCC ATG TTA CCA AAG CAA CCC
Gly Ser Ser Pro Pro Val Lys Asn Ile Ser Ala Phe Pro Met Leu Pro Lys Gln Pro
935 940 945 950

5 ATG TTG GGT GGG AAT CCA AGA ATG ATG GAT AGT CAG GAA AAT TAT GGC TCA AGT ATG
Met Leu Gly Gly Asn Pro Arg Met Met Asp Ser Gln Glu Asn Tyr Gly Ser Ser Met
955 960 965

GGT GGG CCA AAC CGA AAT GTG ACT GTG ACT CAG ACT CCT TCC TCA GGA GAC TGG GGC
Gly Gly Pro Asn Arg Asn Val Thr Val Thr Gln Thr Pro Ser Ser Gly Asp Trp Gly
970 975 980 985

10 TTA CCA AAC TCA AAG GCC GGC AGA ATG GAA CCT ATG AAT TCA AAC TCC ATG GGA AGA
Leu Pro Asn Ser Lys Ala Gly Arg Met Glu Pro Met Asn Ser Asn Ser Met Gly Arg
990 995 1000 1005

CCA GGA GGA GAT TAT AAT ACT TCT TTA CCC AGA CCT GCA CTG GGT GGC TCT ATT CCC
Pro Gly Gly Asp Tyr Asn Thr Ser Leu Pro Arg Pro Ala Leu Gly Gly Ser Ile Pro
1010 1015 1020 1025

15 ACA TTG CCT CTT CGG TCT AAT AGC ATA CCA GGT GCG AGA CCA GTA TTG CAA CAG CAG
Thr Leu Pro Leu Arg Ser Asn Ser Ile Pro Gly Ala Arg Pro Val Leu Gln Gln Gln
1030 1035 1040 1045

20 CAG CAG ATG CTT CAA ATG AGG CCT GGT GAA ATC CCC ATG GGA ATG GGC GCT AAT CCC
Gln Gln Met Leu Gln Met Arg Pro Gly Ile Pro Met Gly Met Gly Ala Asn Pro
1050 1055 1060

TAT GGC CAA GCA GCA GCA TCT AAC CAA CTG GGT TCC TGG CCC GAT GGC ATG TTG TCC
Tyr Gly Gln Ala Ala Ala Ser Asn Gln Leu Gly Ser Trp Pro Asp Gly Met Leu Ser
1065 1070 1075 1080

25 ATG GAA CAA GTT TCT CAT GGC ACT CAA AAT AGG CCT CTT CTT AGG AAT TCC CTG GAT
Met Glu Gln Val Ser His Gly Thr Gln Asn Arg Pro Leu Leu Arg Asn Ser Leu Asp
1085 1090 1095 1100

GAT CTT GTT GGG CCA CCT TCC AAC CTG GAA GGC CAG AGT GAC GAA AGA GCA TTA TTG
Asp Leu Val Gly Pro Pro Ser Asn Leu Glu Gly Gln Ser Asp Glu Arg Ala Leu Leu
1105 1110 1115 1120

30 GAC CAG CTG CAC ACT CTT CTC AGC AAC ACA GAT GCC ACA GGC CTG GAA GAA ATT GAC
Asp Gln Leu His Thr Leu Leu Ser Asn Thr Asp Ala Thr Gly Leu Glu Glu Ile Asp
1125 1130 1135 1140

35 AGA GCT TTG GGC ATT CCT GAA CTT GTC AAT CAG GGA CAG GCA TTA GAG CCC AAA CAG
Arg Ala Leu Gly Ile Pro Glu Leu Val Asn Gln Gly Gln Ala Leu Glu Pro Lys Gln
1145 1150 1155

GAT GCT TTC CAA GGC CAA GAA GCA GCA GTA ATG ATG GAT CAG AAG GCA GGA TTA TAT
Asp Ala Phe Gln Gly Gln Glu Ala Ala Val Met Met Asp Gln Lys Ala Gly Leu Tyr
1160 1165 1170 1175

40 GGA CAG ACA TAC CCA GCA CAG GGG CCT CCA ATG CAA GGA GGC TTT CAT CTT CAG GGA
Gly Gln Thr Tyr Pro Ala Gln Gly Pro Pro Met Gln Gly Gly Phe His Leu Gln Gly
1180 1185 1190 1195

CAA TCA CCA TCT TTT AAC TCT ATG ATG AAT CAG ATG AAC CAG CAA GGC AAT TTT CCT
Gln Ser Pro Ser Phe Asn Ser Met Met Asn Gln Met Asn Gln Gln Gly Asn Phe Pro
1200 1205 1210 1215

45 CTC CAA GGA ATG CAC CCA CGA GCC AAC ATC ATG AGA CCC CGG ACA AAC ACC CCC AAG
Leu Gln Gly Met His Pro Arg Ala Asn Ile Met Arg Pro Arg Thr Asn Thr Pro Lys
1220 1225 1230 1235

50 CAA CTT AGA ATG CAG CTT CAG CAG AGG CTG CAG GGC CAG CAG TTT TTG AAT CAG AGC
Gln Leu Arg Met Gln Leu Gln Gln Arg Leu Gln Gly Gln Gln Phe Leu Asn Gln Ser
1240 1245 1250

CGA CAG GCA CTT GAA TTG AAA ATG GAA AAC CCT ACT GCT GGT GGT GCT GCG GTG ATG
Arg Gln Ala Leu Glu Leu Lys Met Glu Asn Pro Thr Ala Gly Gly Ala Ala Val Met
1255 1260 1265 1270

55 AGG CCT ATG ATG CAG CCC CAG CAG GGT TTT CTT AAT GCT CAA ATG GTC GCC CAA CGC
Arg Pro Met Met Gln Pro Gln Gln Gly Phe Leu Asn Ala Gln Met Val Ala Gln Arg
1275 1280 1285 1290

AGC AGA GAG CTG CTA AGT CAT CAC TTC CGA CAA CAG AGG GTG GCT ATG ATG ATG CAG
Ser Arg Glu Leu Leu Ser His His Phe Arg Gln Gln Arg Val Ala Met Met Met Gln
1295 1300 1305 1310

60 CAG CAG CAG CAG CAG CAA CAG CAG CAG CAG CAG CAG CAG CAG CAA CAG CAA CAG
Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
1315 1320 1325 1330

65 CAA CAG CAA CAG CAG CAA CAG CAG CAA ACC CAG GCC TTC AGC CCA CCT CCT AAT GTG
Gln Gln Gln Gln Gln Gln Gln Gln Gln Thr Gln Ala Phe Ser Pro Pro Pro Asn Val
1335 1340 1345

ACT GCT TCC CCC AGC ATG GAT GGG CTT TTG GCA GGA CCC ACA ATG CCA CAA GCT CCT
Thr Ala Ser Pro Ser Met Asp Gly Leu Leu Ala Gly Pro Thr Met Pro Gln Ala Pro
1350 1355 1360 1365

70 CCG CAA CAG TTT CCA TAT CAA CCA AAT TAT GGA ATG GGA CAA CAA CCA GAT CCA GCC

Pro Gln Gln Phe Pro Tyr Gln Pro Asn Tyr Gly Met Gly Gln Gln Pro Asp Pro Ala
1370 1375 1380 1385
5 TTT GGT CGA GTG TCT AGT CCT CCC AAT GCA ATG TCG TCA AGA ATG GGT CCC TCC
Phe Gly Arg Val Ser Ser Pro Pro Asn Ala Met Met Ser Ser Arg Met Gly Pro Ser
1390 1395 1400 1405
CAG AAT CCC ATG ATG CAA CAC CCG CAG GCT GCA TCC ATC TAT CAG TCC TCA GAA ATG
Gln Asn Pro Met Met Gln His Pro Gln Ala Ala Ser Ile Tyr Gln Ser Ser Glu Met
1410 1415 1420 1425
10 AAG GGC TGG CCA TCA GGA AAT TTG GCC AGG AAC AGC TCC TTT TCC CAG CAG CAG TTT
Lys Gly Trp Pro Ser Gly Asn Leu Ala Arg Asn Ser Ser Phe Ser Gln Gln Gln Phe
1430 1435 1440
GCC CAC CAG GGG AAT CCT GCA GTG TAT AGT ATG GTG CAC ATG AAT GGC AGC AGT GGT
Ala His Gln Gly Asn Pro Ala Val Tyr Ser Met Val His Met Asn Gly Ser Ser Gly
1445 1450 1455 1460
15 CAC ATG GGA CAG ATG AAC ATG AAC CCC ATG CCC ATG TCT GGC ATG CCT ATG GGT CCT
His Met Gly Gln Met Asn Met Asn Pro Met Pro Met Ser Gly Met Pro Met Gly Pro
1465 1470 1475 1480
GAT CAG AAA TAC TGC TGA CAT CTC TGC ACC AGG ACC TCT TAA GGA AAC CAC TGT ACA
Asp Gln Lys Tyr Cys ***
1485 1490 1495 1500
20 AAT GAC ACT GCA CTA GGA TTA TTG GGA AGG AAT CAT TGT TCC AGG CAT CCA TCT TGG
1505 1510 1515 1520
AAG AAA GGA CCA GCT TTG AGC TCC ATC AAG GGT ATT TTA AGT GAT GTC ATT TGA GCA
1525 1530 1535
25 GGA CTG GAT TTT AAG CCG AAG GGC AAT ATC TAC GTG TTT TTC CCC CCT CCT TCT GCT
1540 1545 1550 1555
GTG TAT CAT GGT GTT CAA AAC AGA AAT GTT TTT TGG CAT TCC ACC TCC TAG GGA TAT
1560 1565 1570 1575
30 AAT TCT GGA GAC ATG GAG TGT TAC TGA TCA TAA AAC TTT TGT GTC ACT TTT TTC TGC
1580 1585 1590 1595
CTT GCT AGC CAA AAT CTC TTA AAT ACA CGT AGG TGG GCC AGA GAA CAT TGG AAG AAT
1600 1605 1610 1615
CAA GAG AGA TTA GAA TAT CTG GTT TCT CTA GTT GCA GTA TTG GAC AAA GAG CAT AGT
1620 1625 1630
35 CCC AGC CTT CAG GTG TAG TAG TTC TGT GTT GAC CCT TTG TCC AGT GGA ATT GGT GAT
1635 1640 1645 1650
TCT GAA TTG TCC TTT ACT AAT GGT GTT GAG TTG CTC TGT CCC TAT TAT TTG CCC TAG
1655 1660 1665 1670
40 GCT TTC TCC TAA TGA AGG TTT TCA TTT GCC ATT CAT GTC CTG TAA TAC TTC ACC TCC
1675 1680 1685 1690
AGG AAC TGT CAT GGA TGT CCA AAT GGC TTT GCA GAA AGG AAA TGA GAT GAC AGT ATT
1695 1700 1705 1710
45 TAA TCG CAG CAG TAG CAA ACT TTT CAC ATG CTA ATG TGC AGC TGA GTG CAC TTT ATT
1715 1720 1725
TAA AAA GAA TGG ATA AAT GCA ATA TTC TTG AGG TCT TGA GGG AAT AGT GAA ACA CAT
1730 1735 1740 1745
TCC TGG TTT TTG CCT ACA CTT ACG TGT TAG ACA AGA ACT ATG ATT TTT TTT TTA AAG
1750 1755 1760 1765
50 TAC TGG TGT CAC CCT TTG CCT ATA TGG TAG AGC AAT AAT GCT TTT TAA AAA TAA ACT
1770 1775 1780 1785
TCT GAA AAC CCA AGG CCA GGT ACT GCA TTC TGA ATC AGA ATC TCG CAG TGT TTC TGT
1790 1795 1800 1805
55 GAA TAG ATT TTT TTG TAA ATA TGA CCT TTA AGA TAT TGT ATT ATG TAA AAT ATG TAT
1810 1815 1820
ATA CCT TTT TTT GTA GGT CAC AAC AAC TCA TTT TTA CAG AGT TTG TGA AGC TAA ATA
1825 1830 1835 1840
TTT AAC ATT GTT GAT TTC AGT AAG CTG TGT GGT GAG GCT ACC AGT GGA AGA GAC ATC
1845 1850 1855 1860
60 CCT TGA CTT TTG TGG CCT GGG GGA GGG GTA GTG CTC CAC AGC TTT TCC TTC CCC ACC
1865 1870 1875 1880
CCC CAG CCT TAG ATG CCT CGC TCT TTT CAA TCT CTT AAT CTA AAT GCT TTT TAA AGA
1885 1890 1895 1900
65 GAT TAT TTG TTT AGA TGT AGG CAT TTT AAT TTT TTA AAA ATT CCT CTA CCA GAA CTA
1905 1910 1915
AGC ACT TTG TTA ATT TGG GGG GAA AGA ATA GAT ATG GGG AAA TAA ACT TAA AAA AAA
1920 1925 1930 1935
ATC AGG AAT TTA AAA AAA CGA GCA ATT TGA AGA GAA TCT TTT GGA TTT TAA GCA GTC
1940 1945 1950 1955
70 CGA AAT AAT AGC AAT TCA TGG GCT GTG TGT GTG GTA TGT GTG TGT GTG TGT GTG
1960 1965 1970 1975

TAT GTT TAA TTA TGT TAC CTT TTC ATC CCC TTT AGG AGC GTT TTC AGA TTT TGG TTG
 1980 1985 1990 1995
 CTA AGA CCT GAA TCC CAT ATT GAG ATC TCG AGT AGA ATC CTT GGT GTG GTT TCT GGT
 2000 2005 2010
 5 GTC TGC TCA GCT GTC CCC TCA TTC TAC TAA TGT GAT GCT TTC ATT ATG TCC CTG TGG
 2015 2020 2025 2030
 ATT AGA ATA GTG TCA GTT ATT TCT TAA GTA ACT CAG TAC CCA GAA CAG CCA GTT TTA
 2035 2040 2045 2050
 10 CTG TGA TTC AGA GCC ACA GTC TAA CTG AGC ACC TTT TAA ACC CCT CCC TCT TCT GCC
 2055 2060 2065 2070
 CCC TAC CAC TTT TCT GCT GTT GCC TCT CTT TGA CAC CTG TTT TAG TCA GTT GGG AGG
 2075 2080 2085 2090
 AAG GGA AAA ATC AAG TTT AAT TCC CTT TAT CTG GGT TAA TTC ATT TGG TTC AAA TAG
 2095 2100 2105
 15 TTG ACG GAA TTG GGT TTC TGA ATG TCT GTG AAT TTC AGA GGT CTC TGC TAG CCT TGG
 2110 2115 2120 2125
 TAT CAT TTT CTA GCA ATA ACT GAG AGC CAG TTA ATT TTA AGA ATT TCA CAC ATT TAG
 2130 2135 2140 2145
 20 CCA ATC TTT CTA GAT GTC TCT GAA GGT AAG ATC ATT TAA TAT CTT TGA TAT GCT TAC
 2150 2155 2160 2165
 GAG TAA GTG AAT CCT GAT TAT TTC CAG ACC CAC CAC CAG AGT GGA TCT TAT TTT CAA
 2170 2175 2180 2185
 AGC AGT ATA GAC AAT TAT GAG TTT GCC CTC TTT CCC CTA CCA AGT TCA AAA TAT ATC
 2190 2195 2200
 25 TAA GAA AGA TTG TAA ATC CGA AAA CTT CCA TTG TAG TGG CCT GTG CTT TTC AGA TAG
 2205 2210 2215 2220
 TAT ACT CTC CTG TTT GGA GAC AGA GGA AGA ACC AGG TCA GTC TGT CTC TTT TTC AGC
 2225 2230 2235 2240
 30 TCA ATT GTA TCT GAC CCT TCT TTA AGT TAT GTG TGT GGG GAG AAA TAG AAT GGT GCT
 2245 2250 2255 2260
 CTT ATC TTT CTT GAC TTT AAA AAA ATT ATT AAA AAC AAA AAA AAA AAA AA
 2265 2270 2275

(2) INFORMATION FOR SEQ ID NO: 2:

35 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 186

(B) TYPE: amino acid

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Leu Leu Gln Ala Leu Asp Gly Phe Leu Phe Val Val Asn Arg Asp Gly Asn Ile Val
 1 5 10 15
 Phe Val Ser Glu Asn Val Thr Gln Tyr Leu Gln Tyr Lys Gln Glu Asp Leu Val Asn
 20 25 30 35
 Thr Ser Val Tyr Asn Ile Leu His Glu Glu Asp Arg Lys Asp Phe Leu Lys Asn Leu
 40 45 50 55
 Pro Lys Ser Thr Val Asn Gly Val Ser Trp Thr Asn Glu Thr Gln Arg Gln Lys Ser
 60 65 70 75
 50 His Thr Phe Asn Cys Arg Met Leu Met Lys Thr Pro His Asp Ile Leu Glu Asp Ile
 80 85 90 95
 Asn Ala Ser Pro Glu Met Arg Gln Arg Tyr Glu Thr Met Gln Cys Phe Ala Leu Ser
 100 105 110 115
 Gln Pro Arg Ala Met Met Glu Glu Gly Glu Asp Leu Gln Ser Cys Met Ile Cys Val
 120 125 130 135
 Ala Arg Arg Ile Thr Thr Gly Glu Arg Thr Phe Pro Ser Asn Pro Glu Ser Phe Ile
 140 145 150 155
 Thr Arg His Asp Leu Ser Gly Lys Val Val Asn Ile Asp Thr Asn Ser Leu Arg Ser
 160 165 170 175
 60 Ser Met Arg Pro Gly Phe Glu Asp Ile Ile Arg Arg Cys Ile Gln
 175 180 185

(2) INFORMATION FOR SEQ ID NO: 3:

65 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 73

(B) TYPE: amino acid

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

5 Arg Lys Arg Lys Leu Pro Cys Asp Thr Pro Gly Gln Gly Leu Thr Cys Ser Gly Glu
1 5 10 15
Lys Arg Arg Arg Glu Gln Glu Ser Lys Tyr Ile Glu Glu Leu Ala Glu Leu Ile Ser
20 25 130 135
Ala Asn Leu Ser Asp Ile Asp Asn Phe Asn Val Lys Pro Asp Lys Cys Ala Ile Leu
140 145 150 155
10 Lys Glu Thr Val Arg Gln Ile Arg Gln Ile Lys Glu Gln Gly Lys Thr
160 165 170

(2) INFORMATION FOR SEQ ID NO: 4:

(i) SEQUENCE CHARACTERISTICS:

- 15 (A) LENGTH: 1419
(B) TYPE: human amino acid of AIB1
(C) STRANDEDNESS: Single
(D) TOPOLOGY: Linear

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Met Ser Gly Leu Gly Glu Asn Leu Asp Pro Leu Ala Ser Asp Ser Arg Lys Arg Lys
1 5 10 15
Leu Pro Cys Asp Thr Pro Gly Gln Gly Leu Thr Cys Ser Gly Glu Lys Arg Arg Arg
20 25 30 35
25 Glu Gln Glu Ser Lys Tyr Ile Glu Glu Leu Ala Glu Leu Ile Ser Ala Asn Leu Ser
40 45 50 55
Asp Ile Asp Asn Phe Asn Val Lys Pro Asp Lys Cys Ala Ile Leu Lys Glu Thr Val
60 65 70 75
30 Arg Gln Ile Arg Gln Ile Lys Glu Gln Gly Lys Thr Ile Ser Asn Asp Asp Asp Val
80 85 90 95
Gln Lys Ala Asp Val Ser Ser Thr Gly Gln Gly Val Ile Asp Lys Asp Ser Leu Gly
100 105 110
Pro Leu Leu Leu Gln Ala Leu Asp Gly Phe Leu Phe Val Val Asn Arg Asp Gly Asn
115 120 125 130
35 Ile Val Phe Val Ser Glu Asn Val Thr Gln Tyr Leu Gln Tyr Lys Gln Glu Asp Leu
135 140 145 150
Val Asn Thr Ser Val Tyr Asn Ile Leu His Glu Glu Asp Arg Lys Asp Phe Leu Lys
155 160 165 170
40 Asn Leu Pro Lys Ser Thr Val Asn Gly Val Ser Trp Thr Asn Glu Thr Gln Arg Gln
175 180 185 190
Lys Ser His Thr Phe Asn Cys Arg Met Leu Met Lys Thr Pro His Asp Ile Leu Glu
195 200 205
Asp Ile Asn Ala Ser Pro Glu Met Arg Gln Arg Tyr Glu Thr Met Gln Cys Phe Ala
210 215 220 225
45 Leu Ser Gln Pro Arg Ala Met Met Glu Glu Gly Glu Asp Leu Gln Ser Cys Met Ile
230 235 240 245
Cys Val Ala Arg Arg Ile Thr Thr Gly Glu Arg Thr Phe Pro Ser Asn Pro Glu Ser
250 255 260 265
50 Phe Ile Thr Arg His Asp Leu Ser Gly Lys Val Val Asn Ile Asp Thr Asn Ser Leu
270 275 280 285
Arg Ser Ser Met Arg Pro Gly Phe Glu Asp Ile Ile Arg Arg Cys Ile Gln Arg Phe
290 295 300
Phe Ser Leu Asn Asp Gly Gln Ser Trp Ser Gln Lys Arg His Tyr Gln Glu Ala Tyr
305 310 315 320
55 Leu Asn Gly His Ala Glu Thr Pro Val Tyr Arg Phe Ser Leu Ala Asp Gly Thr Ile
325 330 335 340
Val Thr Ala Gln Thr Lys Ser Lys Leu Phe Arg Asn Pro Val Thr Asn Asp Arg His
345 350 355 360
60 Gly Phe Val Ser Thr His Phe Leu Gln Arg Glu Gln Asn Gly Tyr Arg Pro Asn Pro
365 370 375 380
Asn Pro Val Gly Gln Gly Ile Arg Pro Pro Met Ala Gly Cys Asn Ser Ser Val Gly
385 390 395
Gly Met Ser Met Ser Pro Asn Gln Gly Leu Gln Met Pro Ser Ser Arg Ala Tyr Gly
400 405 410 415
65 Leu Ala Asp Pro Ser Thr Thr Gly Gln Met Ser Gly Ala Arg Tyr Gly Ser Ser
420 425 430 435
Asn Ile Ala Ser Leu Thr Pro Gly Pro Gly Met Gln Ser Pro Ser Ser Tyr Gln Asn
440 445 450 455

Asn Asn Tyr Gly Leu Asn Met Ser Ser Pro Pro His Gly Ser Pro Gly Leu Ala Pro
 460 465 470 475
 Asn Gln Gln Asn Ile Met Ile Ser Pro Arg Asn Arg Gly Ser Pro Lys Ile Ala Ser
 480 485 490
 5 His Gln Phe Ser Pro Val Ala Gly Val His Ser Pro Met Ala Ser Ser Gly Asn Thr
 495 500 505 510
 Gly Asn His Ser Phe Ser Ser Ser Leu Ser Ala Leu Gln Ala Ile Ser Glu Gly
 515 520 525 530
 10 Val Gly Thr Ser Leu Leu Ser Thr Leu Ser Ser Pro Gly Pro Lys Leu Asp Asn Ser
 535 540 545 550
 Pro Asn Met Asn Ile Thr Gln Pro Ser Lys Val Ser Asn Gln Asp Ser Lys Ser Pro
 555 560 565 570
 Leu Gly Phe Tyr Cys Asp Gln Asn Pro Val Glu Ser Ser Met Cys Gln Ser Asn Ser
 575 580 585
 15 Arg Asp His Leu Ser Asp Lys Glu Ser Lys Glu Ser Ser Val Glu Gly Ala Glu Asn
 590 595 600 605
 Gln Arg Gly Pro Leu Glu Ser Lys Gly His Lys Lys Leu Leu Gln Leu Thr Cys
 610 615 620 625
 20 Ser Ser Asp Asp Arg Gly His Ser Ser Leu Thr Asn Ser Pro Leu Asp Ser Ser Cys
 630 635 640 645
 Lys Glu Ser Ser Val Ser Val Thr Ser Pro Ser Gly Val Ser Ser Ser Thr Ser Gly
 650 655 660 665
 Gly Val Ser Ser Thr Ser Asn Met His Gly Ser Leu Leu Gln Glu Lys His Arg Ile
 670 675 680
 25 Leu His Lys Leu Leu Gln Asn Gly Asn Ser Pro Ala Glu Val Ala Lys Ile Thr Ala
 685 690 695 700
 Glu Ala Thr Gly Lys Asp Thr Ser Ser Ile Thr Ser Cys Gly Asp Gly Asn Val Val
 705 710 715 720
 30 Lys Gln Glu Gln Leu Ser Pro Lys Lys Lys Glu Asn Asn Ala Leu Leu Arg Tyr Leu
 725 730 735 740
 Leu Asp Arg Asp Asp Pro Ser Asp Ala Leu Ser Lys Glu Leu Gln Pro Gln Val Glu
 745 750 755 760
 Gly Val Asp Asn Lys Met Ser Gln Cys Thr Ser Ser Thr Ile Pro Ser Ser Ser Gln
 765 770 775
 35 Glu Lys Asp Pro Lys Ile Lys Thr Glu Thr Ser Glu Glu Gly Ser Gly Asp Leu Asp
 780 785 790 795
 Asn Leu Asp Ala Ile Leu Gly Asp Leu Thr Ser Ser Asp Phe Tyr Asn Asn Ser Ile
 800 805 810 815
 40 Ser Ser Asn Gly Ser His Leu Gly Thr Lys Gln Gln Val Phe Gln Gly Thr Asn Ser
 820 825 830 835
 Leu Gly Leu Lys Ser Ser Gln Ser Val Gln Ser Ile Arg Pro Pro Tyr Asn Arg Ala
 840 845 850 855
 Val Ser Leu Asp Ser Pro Val Ser Val Gly Ser Ser Pro Pro Val Lys Asn Ile Ser
 860 865 870
 45 Ala Phe Pro Met Leu Pro Lys Gln Pro Met Leu Gly Gly Asn Pro Arg Met Met Asp
 875 880 885 890
 Ser Gln Glu Asn Tyr Gly Ser Ser Met Gly Gly Pro Asn Arg Asn Val Thr Val Thr
 895 900 905 910
 50 Gln Thr Pro Ser Ser Gly Asp Trp Gly Leu Pro Asn Ser Lys Ala Gly Arg Met Glu
 915 920 925 930
 Pro Met Asn Ser Asn Ser Met Gly Arg Pro Gly Gly Asp Tyr Asn Thr Ser Leu Pro
 935 940 945 950
 Arg Pro Ala Leu Gly Gly Ser Ile Pro Thr Leu Pro Leu Arg Ser Asn Ser Ile Pro
 955 960 965
 55 Gly Ala Arg Pro Val Leu Gln Gln Gln Gln Met Leu Gln Met Arg Pro Gly Glu
 970 975 980 985
 Ile Pro Met Gly Met Gly Ala Asn Pro Tyr Gly Gln Ala Ala Ser Asn Gln Leu
 990 995 1000 1005
 60 Gly Ser Trp Pro Asp Gly Met Leu Ser Met Glu Gln Val Ser His Gly Thr Gln Asn
 1010 1015 1020 1025
 Arg Pro Leu Leu Arg Asn Ser Leu Asp Asp Leu Val Gly Pro Pro Ser Asn Leu Glu
 1030 1035 1040
 1045
 65 Gly Gln Ser Asp Glu Arg Ala Leu Leu Asp Gln Leu His Thr Leu Leu Ser Asn Thr
 1050 1055 1060
 Asp Ala Thr Gly Leu Glu Glu Ile Asp Arg Ala Leu Gly Ile Pro Glu Leu Val Asn
 1065 1070 1075 1080
 Gln Gly Gln Ala Leu Glu Pro Lys Gln Asp Ala Phe Gln Gly Gln Glu Ala Ala Val
 1085 1090 1095 1100
 70 Met Met Asp Gln Lys Ala Gly Leu Tyr Gly Gln Thr Tyr Pro Ala Gln Gly Pro Pro
 1105 1110 1115 1120

Met Gln Gly Gly Phe His Leu Gln Gly Gln Ser Pro Ser Phe Asn Ser Met Met Asn
 1125 1130 1135
 1140
 5 Gln Met Asn Gln Gln Gly Asn Phe Pro Leu Gln Gly Met His Pro Arg Ala Asn Ile
 1145 1150 1155
 Met Arg Pro Arg Thr Asn Thr Pro Lys Gln Leu Arg Met Gln Leu Gln Gln Arg Leu
 1160 1165 1170 1175
 Gln Gly Gln Gln Phe Leu Asn Gln Ser Arg Gln Ala Leu Glu Leu Lys Met Glu Asn
 1180 1185 1190 1195
 10 Pro Thr Ala Gly Gly Ala Ala Val Met Arg Pro Met Met Gln Pro Gln Gln Gly Phe
 1200 1205 1210 1215
 Leu Asn Ala Gln Met Val Ala Gln Arg Ser Arg Glu Leu Ser His His Phe Arg
 1220 1225 1230
 1235
 15 Gln Gln Arg Val Ala Met Met Met Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
 1240 1245 1250
 Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Thr
 1255 1260 1265 1270
 20 Gln Ala Phe Ser Pro Pro Asn Val Thr Ala Ser Pro Ser Met Asp Gly Leu Leu
 1275 1280 1285 1290
 Ala Gly Pro Thr Met Pro Gln Ala Pro Pro Gln Gln Phe Pro Tyr Gln Pro Asn Tyr
 1295 1300 1305 1310
 Gly Met Gly Gln Gln Pro Asp Pro Ala Phe Gly Arg Val Ser Ser Pro Pro Asn Ala
 1315 1320 1325 1330
 25 Met Met Ser Ser Arg Met Gly Pro Ser Gln Asn Pro Met Met Gln His Pro Gln Ala
 1335 1340 1345
 Ala Ser Ile Tyr Gln Ser Ser Glu Met Lys Gly Trp Pro Ser Gly Asn Leu Ala Arg
 1350 1355 1360 1365
 30 Asn Ser Ser Phe Ser Gln Gln Gln Phe Ala His Gln Gly Asn Pro Ala Val Tyr Ser
 1370 1375 1380 1385
 Met Val His Met Asn Gly Ser Ser Gly His Met Gly Gln Met Asn Met Asn Pro Met
 1390 1395 1400 1405
 Pro Met Ser Gly Met Pro Met Gly Pro Asp Gln Lys Tyr Cys ***
 1410 1415 1420

(2) INFORMATION FOR SEQ ID NO: 5:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22

(B) TYPE: nucleotides

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

5'-TCATCACTTCCGACAACAGAGG-3'

(2) INFORMATION FOR SEQ ID NO: 6:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20

(B) TYPE: nucleotides

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

5'-CCAGAAACGTCACTATCAAG-3'

(2) INFORMATION FOR SEQ ID NO: 7:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19

(B) TYPE: nucleotides

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

5'-TTACTGGAACCCCCATACC-3'

(2) INFORMATION FOR SEQ ID NO: 8:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 950

(B) TYPE: amino acid

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

| | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 10 | Cys | Ile | Gln | Arg | Phe | Phe | Ser | Leu | Asn | Asp | Gly | Gln | Ser | Trp | Ser | Gln | Lys | Arg | His |
| | 1 | | | | 5 | | | | | 10 | | | | 15 | | | | | |
| | Tyr | Gln | Glu | Ala | Tyr | Leu | Asn | Gly | His | Ala | Glu | Thr | Pro | Val | Tyr | Arg | Phe | Ser | Leu |
| | 20 | | | | 25 | | | | | 30 | | | | | 35 | | | | |
| | Ala | Asp | Gly | Thr | Ile | Val | Thr | Ala | Gln | Thr | Lys | Ser | Lys | Leu | Phe | Arg | Asn | Pro | Val |
| | 40 | | | | | 45 | | | | 50 | | | | | 55 | | | | |
| 15 | Thr | Asn | Asp | Arg | His | Gly | Phe | Val | Ser | Thr | His | Phe | Leu | Gln | Arg | Glu | Gln | Asn | Gly |
| | 60 | | | | | 65 | | | | 70 | | | | | 75 | | | | |
| | Tyr | Arg | Pro | Asn | Pro | Asn | Pro | Val | Gly | Gln | Gly | Ile | Arg | Pro | Pro | Met | Ala | Gly | Cys |
| | 80 | | | | | 85 | | | | 90 | | | | | 95 | | | | |
| 20 | Asn | Ser | Ser | Val | Gly | Gly | Met | Ser | Met | Ser | Pro | Asn | Gln | Gly | Leu | Gln | Met | Pro | Ser |
| | 100 | | | | | 105 | | | | 110 | | | | | 115 | | | | |
| | Ser | Arg | Ala | Tyr | Gly | Leu | Ala | Asp | Pro | Ser | Thr | Thr | Gly | Gln | Met | Ser | Gly | Ala | Arg |
| | 120 | | | | | 125 | | | | 130 | | | | | 135 | | | | |
| | Tyr | Gly | Gly | Ser | Ser | Asn | Ile | Ala | Ser | Leu | Thr | Pro | Gly | Pro | Gly | Met | Gln | Ser | Pro |
| | 140 | | | | | 145 | | | | 150 | | | | | 155 | | | | |
| 25 | Ser | Ser | Tyr | Gln | Asn | Asn | Asn | Tyr | Gly | Leu | Asn | Met | Ser | Ser | Pro | Pro | His | Gly | Ser |
| | 160 | | | | | 165 | | | | 170 | | | | | 175 | | | | |
| | Pro | Gly | Leu | Ala | Pro | Asn | Gln | Gln | Asn | Ile | Met | Ile | Ser | Pro | Arg | Asn | Arg | Gly | Ser |
| | 180 | | | | | 185 | | | | 190 | | | | | 195 | | | | |
| 30 | Pro | Lys | Ile | Ala | Ser | His | Gln | Phe | Ser | Pro | Val | Ala | Gly | Val | His | Ser | Pro | Met | Ala |
| | 200 | | | | | 205 | | | | 210 | | | | | 215 | | | | |
| | Ser | Ser | Gly | Asn | Thr | Gly | Asn | His | Ser | Phe | Ser | Ser | Ser | Ser | Leu | Ser | Ala | Leu | Gln |
| | 220 | | | | | 225 | | | | 230 | | | | | 235 | | | | |
| | Ala | Ile | Ser | Glu | Gly | Val | Gly | Thr | Ser | Leu | Leu | Ser | Thr | Leu | Ser | Ser | Pro | Gly | Pro |
| | 240 | | | | | 245 | | | | 250 | | | | | 255 | | | | |
| 35 | Lys | Leu | Asp | Asn | Ser | Pro | Asn | Met | Asn | Ile | Thr | Gln | Pro | Ser | Lys | Val | Ser | Asn | Gln |
| | 260 | | | | | 265 | | | | 270 | | | | | 275 | | | | |
| | Asp | Ser | Lys | Ser | Pro | Leu | Gly | Phe | Tyr | Cys | Asp | Gln | Asn | Pro | Val | Glu | Ser | Ser | Met |
| | 280 | | | | | 285 | | | | 290 | | | | | 295 | | | | |
| 40 | Cys | Gln | Ser | Asn | Ser | Arg | Asp | His | Leu | Ser | Asp | Lys | Glu | Ser | Lys | Glu | Ser | Ser | Val |
| | 300 | | | | | 305 | | | | 310 | | | | | 315 | | | | |
| | Glu | Gly | Ala | Glu | Asn | Gln | Arg | Gly | Pro | Leu | Glu | Ser | Lys | Gly | His | Lys | Lys | Leu | Leu |
| | 320 | | | | | 325 | | | | 330 | | | | | 335 | | | | |
| | Gln | Leu | Leu | Thr | Cys | Ser | Asp | Asp | Arg | Gly | His | Ser | Ser | Leu | Thr | Asn | Ser | Pro | |
| 45 | Leu | Asp | Ser | Ser | Cys | Lys | Glu | Ser | Ser | Val | Ser | Val | Thr | Ser | Pro | Ser | Gly | Val | Ser |
| | 340 | | | | | 345 | | | | 350 | | | | | 355 | | | | |
| | Ser | Ser | Thr | Ser | Gly | Gly | Val | Ser | Ser | Thr | Ser | Asn | Met | His | Gly | Ser | Leu | Leu | Gln |
| | 360 | | | | | 365 | | | | 370 | | | | | 375 | | | | |
| 50 | Glu | Lys | His | Arg | Ile | Leu | His | Lys | Leu | Leu | Gln | Asn | Gly | Asn | Ser | Pro | Ala | Glu | Val |
| | 380 | | | | | 385 | | | | 390 | | | | | 395 | | | | |
| | Ala | Lys | Ile | Thr | Ala | Glu | Ala | Thr | Gly | Lys | Asp | Thr | Ser | Ser | Ile | Thr | Ser | Cys | Gly |
| | 400 | | | | | 405 | | | | 410 | | | | | 415 | | | | |
| | Asp | Gly | Asn | Val | Val | Lys | Gln | Glu | Gln | Leu | Ser | Pro | Lys | Lys | Lys | Glu | Asn | Asn | Ala |
| | 420 | | | | | 425 | | | | 430 | | | | | 435 | | | | |
| 55 | Leu | Leu | Arg | Tyr | Leu | Leu | Asp | Arg | Asp | Asp | Pro | Ser | Asp | Ala | Leu | Ser | Lys | Glu | Leu |
| | 440 | | | | | 445 | | | | 450 | | | | | 455 | | | | |
| | Gln | Pro | Gln | Val | Glu | Gly | Val | Asp | Asn | Lys | Met | Ser | Gln | Cys | Thr | Ser | Ser | Thr | Ile |
| | 460 | | | | | 465 | | | | 470 | | | | | 475 | | | | |
| 60 | Pro | Ser | Ser | Ser | Gln | Glu | Lys | Asp | Pro | Lys | Ile | Lys | Thr | Glu | Thr | Ser | Glu | Glu | Gly |
| | 480 | | | | | 485 | | | | 490 | | | | | 495 | | | | |
| | Ser | Gly | Asp | Leu | Asp | Asn | Leu | Asp | Ala | Ile | Leu | Gly | Asp | Leu | Thr | Ser | Ser | Asp | Phe |
| | 500 | | | | | 505 | | | | 510 | | | | | 515 | | | | |
| | Tyr | Asn | Asn | Ser | Ile | Ser | Ser | Asn | Gly | Ser | His | Leu | Gly | Thr | Lys | Gln | Gln | Val | Phe |
| | 520 | | | | | 525 | | | | 530 | | | | | 535 | | | | |
| 65 | Gln | Gly | Thr | Asn | Ser | Leu | Gly | Leu | Lys | Ser | Ser | Gln | Ser | Val | Gln | Ser | Ile | Arg | Pro |
| | 540 | | | | | 545 | | | | 550 | | | | | 555 | | | | |
| | Pro | Tyr | Asn | Arg | Ala | Val | Ser | Leu | Asp | Ser | Pro | Val | Ser | Val | Gly | Ser | Ser | Pro | Pro |
| | 560 | | | | | 565 | | | | 570 | | | | | 575 | | | | |

Val Lys Asn Ile Ser Ala Phe Pro Met Leu Pro Lys Gln Pro Met Leu Gly Gly Asn
 575 580 585
 Pro Arg Met Met Asp Ser Gln Glu Asn Tyr Gly Ser Ser Met Gly Gly Pro Asn Arg
 590 595 600
 5 Asn Val Thr Val Thr Gln Thr Pro Ser Ser Gly Asp Trp Gly Leu Pro Asn Ser Lys
 610 615 620 625
 Ala Gly Arg Met Glu Pro Met Asn Ser Asn Ser Met Gly Arg Pro Gly Gly Asp Tyr
 630 635 640 645
 10 Asn Thr Ser Leu Pro Arg Pro Ala Leu Gly Gly Ser Ile Pro Thr Leu Pro Leu Arg
 650 655 660 665
 Ser Asn Ser Ile Pro Gly Ala Arg Pro Val Leu Gln Gln Gln Gln Gln Met Leu Gln
 670 675 680
 Met Arg Pro Gly Glu Ile Pro Met Gly Met Gly Ala Asn Pro Tyr Gly Gln Ala Ala
 685 690 695 700
 15 Ala Ser Asn Gln Leu Gly Ser Trp Pro Asp Gly Met Leu Ser Met Glu Gln Val Ser
 705 710 715 720
 His Gly Thr Gln Asn Arg Pro Leu Leu Arg Asn Ser Leu Asp Asp Leu Val Gly Pro
 725 730 735 740
 20 Pro Ser Asn Leu Glu Gly Gln Ser Asp Glu Arg Ala Leu Leu Asp Gln Leu His Thr
 745 750 755 760
 Leu Leu Ser Asn Thr Asp Ala Thr Gly Leu Glu Glu Ile Asp Arg Ala Leu Gly Ile
 765 770 775
 Pro Glu Leu Val Asn Gln Gly Gln Ala Leu Glu Pro Lys Gln Asp Ala Phe Gln Gly
 780 785 790 795
 25 Gln Glu Ala Ala Val Met Asp Gln Lys Ala Gly Leu Tyr Gly Gln Thr Tyr Pro
 800 805 810 815
 Ala Gln Gly Pro Pro Met Gln Gly Gly Phe His Leu Gln Gly Gln Ser Pro Ser Phe
 820 825 830 835
 30 Asn Ser Met Met Asn Gln Met Asn Gln Gln Gly Asn Phe Pro Leu Gln Gly Met His
 840 845 850 855
 Pro Arg Ala Asn Ile Met Arg Pro Arg Thr Asn Thr Pro Lys Gln Leu Arg Met Gln
 860 865 870
 Leu Gln Gln Arg Leu Gln Gly Gln Gln Phe Leu Asn Gln Ser Arg Gln Ala Leu Glu
 875 880 885 890
 35 Leu Lys Met Glu Asn Pro Thr Ala Gly Gly Ala Ala Val Met Arg Pro Met Met Gln
 895 900 905 910
 Pro Gln Gln Gly Phe Leu Asn Ala Gln Met Val Ala Gln Arg Ser Arg Glu Leu Leu
 915 920 925 930
 40 Ser His His Phe Arg Gln Gln Arg Val Ala Met Met Met Gln Gln Gln Gln Gln Gln
 935 940 945 950
 Gln

(2) INFORMATION FOR SEQ ID NO: 9:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 4621 nucleotides; 1539 amino acid residues

(B) TYPE: mouse DNA and amino acid

(C) STRANDEDNESS: Single

(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

50
 G GCG GCG AAC GGA TCA AAA GAA TTT GCT GAA CAG TGG ACT CCG AGA TCG GTA AAA
 1 5 10 15
 CGA ACT CTT CCC TGC CCT TCC TGA ACA GCT GTC AGT TGC TGA TCT GTG ATC AGG
 20 25 30 35
 55 ATG AGT GGA CTA GGC GAA AGC TCT TTG GAT CCG CTG GCC GCT GAG TCT CGG AAA
 Met Ser Gly Leu Gly Glu Ser Ser Leu Asp Pro Leu Ala Glu Ser Arg Lys
 40 45 50 55
 CGC AAA CTG CCC TGT GAT GCC CCA GGA CAG GGG CTT GTC TAC AGT GGT GAG AAG
 Arg Lys Leu Pro Cys Asp Ala Pro Gly Gln Gly Leu Val Tyr Ser Gly Glu Lys
 60 65 70
 TGG CGA CGG GAG CAG GAG AGC AAG TAC ATA GAG GAG CTG GCA GAG CTC ATC TCT
 Trp Arg Arg Glu Gln Glu Ser Lys Tyr Ile Glu Glu Leu Ala Glu Leu Ile Ser
 75 80 85 90
 65 GCA AAT CTC AGC GAC ATC GAC AAC TTC AAT GTC AAG CCA GAT AAA TGT GCC ATC
 Ala Asn Leu Ser Asp Ile Asp Asn Phe Asn Val Lys Pro Asp Lys Cys Ala Ile
 95 100 105
 CTA AAG GAG ACA GTG AGA CAG ATA CGG CAA ATA AAA GAA CAA GGA AAA ACT ATT
 Leu Lys Glu Thr Val Arg Gln Ile Arg Gln Ile Lys Glu Gln Gly Lys Thr Ile
 110 115 120 125

TCC AGT GAT GAT GAT GTT CAA AAA GCT GAT GTG TCT TCT ACA GGG CAG GGA GTC
 Ser Ser Asp Asp Asp Val Gln Lys Ala Asp Val Ser Ser Thr Gly Gln Gly Val
 130 135 140 145
 5 ATT GAT AAA GAC TCT TTA GGA CCG CTT TTA CTA CAG GCA CTG GAT GGT TTC CTG
 Ile Asp Lys Asp Ser Leu Gly Pro Leu Leu Leu Gln Ala Leu Asp Gly Phe Leu
 150 155 160
 TTT GTG GTG AAT CGA GAT GGA AAC ATT GTA TTC GTG TCA GAA AAT GTC ACA CAG
 Phe Val Val Asn Arg Asp Gly Asn Ile Val Phe Val Ser Glu Asn Val Thr Gln
 165 170 175 180
 10 TAT CTG CAG TAC AAG CAG GAG GAC CTG GTT AAC ACA AGT GTC TAC AGC ATC TTA
 Tyr Leu Gln Tyr Lys Gln Glu Asp Leu Val Asn Thr Ser Val Tyr Ser Ile Leu
 185 190 195
 CAT GAG CAA GAC CGG AAG GAT TTT CTT AAA CAC TTA CCA AAA TCC ACA GTT AAT
 His Glu Gln Asp Arg Lys Asp Phe Leu Lys His Leu Pro Lys Ser Thr Val Asn
 200 205 210 215
 15 GGA GTT TCT TGG ACT AAT GAG AAC CAG AGA CAA AAA AGC CAT ACA TTT AAT TGT
 Gly Val Ser Trp Thr Asn Glu Asn Gln Arg Gln Lys Ser His Thr Phe Asn Cys
 220 225 230 235
 20 CGT ATG TTG ATG AAA ACA CAC GAC ATT TTG GAA GAC GTG AAT GCC AGT CCC GAA
 Arg Met Leu Met Lys Thr His Asp Ile Leu Glu Asp Val Asn Ala Ser Pro Glu
 240 245 250
 ACA CGC CAG AGA TAT GAA ACA ATG CAG TGC TTT GCC CTG TCT CAG CCT CGC GCT
 Thr Arg Gln Arg Tyr Glu Thr Met Gln Cys Phe Ala Leu Ser Gln Pro Arg Ala
 255 260 265 270
 25 ATG CTG GAA GAA GGA GAA GAC TTG CAG TGC TGT ATG ATC TGC GTG GCT CGC CGC
 Met Leu Glu Glu Gly Glu Asp Leu Gln Cys Cys Met Ile Cys Val Ala Arg Arg
 275 280 285
 GTG ACT GCG CCA TTC CCA TCC AGT CCT GAG AGC TTT ATT ACC AGA CAT GAC CTT
 Val Thr Ala Pro Phe Pro Ser Ser Pro Glu Ser Phe Ile Thr Arg His Asp Leu
 290 295 300 305
 30 TCC GGA AAG GTT GTC AAT ATA GAT ACA AAC TCA CTT AGA TCT TCC ATG AGG CCT
 Ser Gly Lys Val Val Asn Ile Asp Thr Asn Ser Leu Arg Ser Ser Met Arg Pro
 310 315 320 325
 35 GGC TTT GAA GAC ATA ATC CGA AGA TGT ATC CAG AGG TTC TTC AGT CTG AAT GAT
 Gly Phe Glu Asp Ile Ile Arg Arg Cys Ile Gln Arg Phe Phe Ser Leu Asn Asp
 330 335 340
 GGG CAG TCA TGG TCC CAG AAG CGT CAC TAT CAA GAA GCT TAT GTT CAT GGC CAC
 Gly Gln Ser Trp Ser Gln Lys Arg His Tyr Gln Glu Ala Tyr Val His Gly His
 345 350 355 360
 40 GCA GAG ACC CCC GTG TAT CGT TTC TCC TTG GCT GAT GGA ACT ATT GTG AGT GCG
 Ala Glu Thr Pro Val Tyr Arg Phe Ser Leu Ala Asp Gly Thr Ile Val Ser Ala
 365 370 375
 CAG ACA AAA AGC AAA CTC TTC CGC AAT CCT GTA ACG AAT GAT CGT CAC GGC TTC
 Gln Thr Lys Ser Lys Leu Phe Arg Asn Pro Val Thr Asn Asp Arg His Gly Phe
 380 385 390 395
 45 ATC TCG ACC CAC TTT CTT CAG AGA GAA CAG AAT GGA TAC AGA CCA AAC CCA AAT
 Ile Ser Thr His Phe Leu Gln Arg Glu Gln Asn Gly Tyr Arg Pro Asn Pro Asn
 400 405 410 415
 50 CCC GCA GGA CAA GGC ATC CGA CCT CCT GCA GCA GGG TGT GGC GTG AGC ATG TCT
 Pro Ala Gly Gln Gly Ile Arg Pro Pro Ala Ala Gly Cys Gly Val Ser Met Ser
 420 425 430
 55 CCA AAT CAG AAT GTA CAG ATG ATG GGC AGC CGG ACC TAT GGC GTG CCA GAC CCC
 Pro Asn Gln Asn Val Gln Met Met Gly Ser Arg Thr Tyr Gly Val Pro Asp Pro
 435 440 445 450
 AGC AAC ACA GGG CAG ATG GGT GGA GCT AGG TAC GGG GCT TCT AGT AGC GTA GCC
 Ser Asn Thr Gly Gln Met Gly Gly Ala Arg Tyr Gly Ala Ser Ser Val Ala
 455 460 465
 60 TCA CTG ACG CCA GGA CAA AGC CTA CAG TCG CCA TCT TCC TAT CAG AAC AGC AGC
 Ser Leu Thr Pro Gly Gln Ser Leu Gln Ser Pro Ser Ser Tyr Gln Asn Ser Ser
 470 475 480 485
 TAT GGG CTC AGC ATG AGC AGT CCC CCC CAC GGC AGT CCT GGT CTT GGT CCC AAC
 Tyr Gly Leu Ser Met Ser Ser Pro Pro His Gly Ser Pro Gly Leu Gly Pro Asn
 490 495 500 505
 65 CAG CAG AAC ATC ATG ATT TCC CCT CGG AAT CGT GGC AGC CCA AAG ATG GCC TCC
 Gln Gln Asn Ile Met Ile Ser Pro Arg Asn Arg Gly Ser Pro Lys Met Ala Ser
 510 515 520
 70 CAC CAG TTC TCT CCT GCT GCA GGT GCA CAC TCA CCC ATG GGA CCT TCT GGC AAC
 His Gln Phe Ser Pro Ala Ala Gly Ala His Ser Pro Met Gly Pro Ser Gly Asn
 525 530 535 540

| | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | ACA | GGG | AGC | CAC | AGC | TTT | TCT | AGC | AGC | TCC | CTC | AGT | GCC | TTG | CAA | GCC | ATC | AGT |
| | Thr | Gly | Ser | His | Ser | Phe | Ser | Ser | Ser | Ser | Leu | Ser | Ala | Leu | Gln | Ala | Ile | Ser |
| | | | | 545 | | | | | 550 | | | | | 555 | | | | |
| 5 | GAA | GGC | GTG | GGG | ACC | TCT | CTT | TTA | TCT | ACT | CTG | TCC | TCA | CCA | GGC | CCC | AAA | CTG |
| | Glu | Gly | Val | Gly | Thr | Ser | Leu | Leu | Ser | Thr | Leu | Ser | Ser | Pro | Gly | Pro | Lys | Leu |
| | 560 | | | 565 | | | | | 570 | | | | | 575 | | | | |
| | GAT | AAT | TCT | CCC | AAT | ATG | Asn | ATA | AGC | CAG | CCA | AGT | AAA | GTG | AGT | GGT | CAG | GAC |
| | Asp | Asn | Ser | Pro | Asn | Met | Asn | Ile | Ser | Gln | Pro | Ser | Lys | Val | Ser | Gly | Gln | Asp |
| | | 580 | | | | | 585 | | | | | | 590 | | | | | 595 |
| 10 | TCT | AAG | AGC | CCC | CTA | GGC | TTA | TAC | TGT | GAA | CAG | AAT | CCA | GTG | GAG | AGT | TCA | GTG |
| | Ser | Lys | Ser | Pro | Leu | Gly | Leu | Tyr | Cys | Glu | Gln | Asn | Pro | Val | Glu | Ser | Ser | Val |
| | | | | 600 | | | | | | 605 | | | | 610 | | | | |
| | TGT | CAG | TCA | AAC | AGC | AGA | GAT | CAC | CCA | AGT | GAA | AAA | GAA | AGC | AAG | GAG | AGC | AGT |
| | Cys | Gln | Ser | Asn | Ser | Arg | Asp | His | Pro | Ser | Glu | Lys | Glu | Ser | Lys | Glu | Ser | Ser |
| | 615 | | | | | | 620 | | | | | 625 | | | | | | 630 |
| 15 | GGG | GAG | GTG | TCA | GAG | ACG | CCC | AGG | GGA | CCT | CTG | GAA | AGC | AAA | GGC | CAC | AAG | AAA |
| | Gly | Glu | Val | Ser | Glu | Thr | Pro | Arg | Gly | Pro | Leu | Glu | Ser | Lys | Gly | His | Lys | Lys |
| | | | | 635 | | | | | 640 | | | | | 645 | | | | |
| 20 | CTG | CTG | CAG | TTA | CTC | ACG | TGC | TCC | TCC | GAC | GAC | CGA | GGC | CAT | TCC | TCC | TTG | ACC |
| | Leu | Leu | Gln | Leu | Leu | Thr | Cys | Ser | Ser | Asp | Asp | Arg | Gly | His | Ser | Ser | Leu | Thr |
| | 650 | | | | | 655 | | | | 660 | | | | | | | | |
| | AAC | TCT | CCC | CTG | GAT | CCA | AAC | TGC | AAA | GAC | TCT | TCC | GTT | AGT | GTC | ACC | AGC | CCC |
| | Asn | Ser | Pro | Leu | Asp | Pro | Asn | Cys | Lys | Asp | Ser | Ser | Val | Ser | Val | Thr | Ser | Pro |
| | | | 670 | | | | 675 | | | | | | 680 | | | | | 685 |
| 25 | TCT | GGA | GTG | TCC | TCC | TCA | ACA | TCA | GGG | ACA | GTG | TCT | TCC | ACC | TCC | AAT | GTG | CAT |
| | Ser | Gly | Val | Ser | Ser | Ser | Thr | Ser | Gly | Thr | Val | Ser | Ser | Thr | Ser | Asn | Val | His |
| | | | | | 690 | | | | | 695 | | | | 700 | | | | |
| | GGG | TCT | CTG | TTG | CAA | GAG | AAA | CAC | CGG | ATT | TTG | CAC | AAG | TTG | CTG | CAG | AAT | GGC |
| | Gly | Ser | Leu | Leu | Gln | Glu | Lys | His | Arg | Ile | Leu | His | Lys | Leu | Leu | Gln | Asn | Gly |
| | 705 | | | | | 710 | | | | 715 | | | | | | | | |
| 30 | AAC | TCC | CCA | GCG | GAG | GTC | GCC | AAG | ATC | ACT | GCA | GAG | GCC | ACT | GGG | AAG | GAC | ACG |
| | Asn | Ser | Pro | Ala | Glu | Val | Ala | Lys | Ile | Thr | Ala | Glu | Ala | Thr | Gly | Lys | Asp | Thr |
| | | | | 725 | | | | 730 | | | | | | 735 | | | | 740 |
| 35 | AGC | AGC | ACT | GCT | TCC | TGT | GGA | GAG | GGG | ACA | ACC | AGG | CAG | GAG | CAG | CTG | AGT | CCT |
| | Ser | Ser | Thr | Ala | Ser | Cys | Gly | Glu | Gly | Thr | Thr | Arg | Gln | Glu | Gln | Leu | Ser | Pro |
| | | | | | 745 | | | | | 750 | | | | | 755 | | | |
| | AAG | AAG | AAG | GAG | AAT | AAT | GCT | CTG | CTT | AGA | TAC | CTG | CTG | GAC | AGG | GAT | GAC | CCC |
| | Lys | Lys | Lys | Glu | Asn | Asn | Ala | Leu | Leu | Arg | Tyr | Leu | Leu | Asp | Arg | Asp | Asp | Pro |
| | | | | 760 | | | 765 | | | | | 770 | | | | 775 | | |
| 40 | AGT | GAT | GTG | CTT | GCC | AAA | GAG | CTG | CAG | CCC | CAG | GCC | GAC | AGT | GGG | GAC | AGT | AAA |
| | Ser | Asp | Val | Leu | Ala | Lys | Glu | Leu | Gln | Pro | Gln | Ala | Asp | Ser | Gly | Asp | Ser | Lys |
| | | | | 780 | | | | | 785 | | | | | 790 | | | | |
| 45 | CTG | AGT | CAG | TGC | AGC | TGC | TCC | ACC | AAT | CCC | AGC | TCT | GGC | CAA | GAG | AAA | GAC | CCC |
| | Leu | Ser | Gln | Cys | Ser | Cys | Ser | Thr | Asn | Pro | Ser | Ser | Gly | Gln | Glu | Lys | Asp | Pro |
| | 795 | | | | | 800 | | | | | 805 | | | | | 810 | | |
| | AAA | ATT | AAG | ACC | GAG | ACG | AAC | GAG | GAG | GTA | TCG | GGA | GAC | CTG | GAT | AAT | CTA | GAT |
| | Lys | Ile | Lys | Thr | Glu | Thr | Asn | Glu | Glu | Val | Ser | Gly | Asp | Leu | Asp | Asn | Leu | Asp |
| | | | | 815 | | | | 820 | | | | | 825 | | | | | 830 |
| 50 | GCC | ATT | CTT | GGA | GAT | TTG | ACC | AGT | TCT | GAC | TTC | TAC | AAC | AAT | CCT | ACA | AAT | GGC |
| | Ala | Ile | Leu | Gly | Asp | Leu | Thr | Ser | Ser | Asp | Phe | Tyr | Asn | Asn | Pro | Thr | Asn | Gly |
| | | | | | 835 | | | | | 840 | | | | | 845 | | | |
| | GGT | CAC | CCA | GGG | GCC | AAA | CAG | CAG | ATG | TTT | GCA | GGA | CCG | AGT | TCT | CTG | GGT | TTG |
| | Gly | His | Pro | Gly | Ala | Lys | Gln | Gln | Met | Phe | Ala | Gly | Pro | Ser | Ser | Leu | Gly | Leu |
| | | | | 850 | | | 855 | | | | | 860 | | | | | | 865 |
| 55 | CGA | AGT | CCA | CAG | CCT | GTG | CAG | TCT | GTT | CGT | CCT | CCA | TAT | AAC | CGA | GCG | GTG | TCT |
| | Arg | Ser | Pro | Gln | Pro | Val | Gln | Ser | Val | Arg | Pro | Pro | Tyr | Asn | Arg | Ala | Val | Ser |
| | | | | 870 | | | | | 875 | | | | | 880 | | | | |
| 60 | CTG | GAT | AGC | CCT | GTG | TCT | GTT | GGC | TCA | GGT | CCG | CCA | GTG | AAG | AAT | GTC | AGT | GCT |
| | Leu | Asp | Ser | Pro | Val | Ser | Val | Gly | Ser | Gly | Pro | Pro | Val | Lys | Asn | Val | Ser | Ala |
| | | | | | | 890 | | | | | 895 | | | | | 900 | | |
| | TTC | CCT | GGG | TTA | CCA | AAA | CAG | CCC | ATA | CTG | GCT | GGG | AAT | CCA | AGA | ATG | ATG | GAT |
| | Phe | Pro | Gly | Leu | Pro | Lys | Gln | Pro | Ile | Leu | Ala | Gly | Asn | Pro | Arg | Met | Met | Asp |
| | | | | 905 | | | | 910 | | | | | 915 | | | | | 920 |
| 65 | AGT | CAG | GAG | AAT | TAC | GGT | GCC | AAC | ATG | GGC | CCA | AAC | AGA | AAT | GTT | CCT | GTG | AAT |
| | Ser | Gln | Glu | Asn | Tyr | Gly | Ala | Asn | Met | Gly | Pro | Asn | Arg | Asn | Val | Pro | Val | Asn |
| | | | | 925 | | | | 930 | | | | | | 935 | | | | |
| | CCG | ACT | TCC | TCC | CCC | GGA | GAC | TGG | GGC | TTA | GCT | AAC | TCA | AGG | GCC | AGC | AGA | ATG |
| | Pro | Thr | Ser | Ser | Pro | Gly | Asp | Trp | Gly | Leu | Ala | Asn | Ser | Arg | Ala | Ser | Arg | Met |
| | | | | | | 945 | | | | | 950 | | | | | 955 | | |
| 70 | GAG | CCT | CTG | GCA | TCA | AGT | CCC | CTG | GGA | AGA | ACT | GGA | GCC | GAT | TAC | AGT | GCC | ACT |

| | | | | | | | | | | | | | | | | | | |
|----|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | Glu | Pro | Leu | Ala | Ser | Ser | Pro | Leu | Gly | Arg | Thr | Gly | Ala | Asp | Tyr | Ser | Ala | Thr |
| | 960 | | 960 | | | | | 965 | | | | | 970 | | | | | 975 |
| | TTA | CCC | AGA | CCT | GCC | ATG | GGG | GGC | TCT | GTG | CCT | ACC | TTG | CCA | CTT | CGT | TCT | AAT |
| 5 | Leu | Pro | Arg | Pro | Ala | Met | Gly | Gly | Ser | Val | Pro | Thr | Leu | Pro | Leu | Arg | Ser | Asn |
| | | | | 980 | | | | | | 985 | | | | | 990 | | | |
| | CGA | CTG | CCA | GGT | GCA | AGA | CCA | TCG | TTG | CAG | CAA | CAG | CAG | CAG | CAA | CAG | CAG | CAA |
| | Arg | Leu | Pro | Gly | Ala | Arg | Pro | Ser | Leu | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln |
| | 995 | | | | | | 1000 | | | | | 1005 | | | | | 1010 | |
| 10 | CAG | CAA | CAA | CAA | CAG | CAG | CAA | CAG | CAG | CAG | CAA | CAG | CAG | CAG | CAG | CAA | CAG | CAG |
| | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln |
| | | | | 1015 | | | | | 1020 | | | | 1025 | | | | | |
| | CAG | ATG | CTT | CAA | ATG | AGA | ACT | GGT | GAG | ATT | CCC | ATG | GGA | ATG | GGA | GTC | AAT | CCC |
| | Gln | Met | Leu | Gln | Met | Arg | Thr | Gly | Glu | Ile | Pro | Met | Gly | Met | Gly | Val | Asn | Pro |
| | 1030 | | | | | 1035 | | | | | 1040 | | | | | 1045 | | |
| 15 | TAT | AGC | CCA | GCA | GTG | CCG | TCT | AAC | CAA | CCA | GGT | TCC | TGG | CCA | GAG | GGC | ATG | CTC |
| | Tyr | Ser | Pro | Ala | Val | Pro | Ser | Asn | Gln | Pro | Gly | Ser | Trp | Pro | Glu | Gly | Met | Leu |
| | | | 1050 | | | | | 1055 | | | | | 1060 | | | | | 1065 |
| | TCT | ATG | GAA | CAA | GGT | CCT | CAC | GGG | TCT | CAA | AAT | AGG | CCT | CTT | CTT | AGA | AAC | TCT |
| | Ser | Met | Glu | Gln | Gly | Pro | His | Gly | Ser | Gln | Asn | Arg | Pro | Leu | Leu | Arg | Asn | Ser |
| | | | | | 1070 | | | | | 1075 | | | | | 1080 | | | |
| 20 | CTG | GAT | GAT | CTG | CTT | GGG | CCA | CCT | TCT | AAC | GCA | GAG | GGC | CAG | AGT | GAC | GAG | AGA |
| | Leu | Asp | Asp | Leu | Leu | Gly | Pro | Pro | Ser | Asn | Ala | Glu | Gly | Gln | Ser | Asp | Glu | Arg |
| | 1085 | | | | | 1090 | | | | | | 1095 | | | | | | |
| | GCT | CTG | CTG | GAC | CAG | CTG | CAC | ACA | CTC | CTG | AGC | AAC | ACA | GAT | GCC | ACA | GGT | CTG |
| 25 | Ala | Leu | Leu | Asp | Gln | Leu | His | Thr | Leu | Leu | Ser | Asn | Thr | Asp | Ala | Thr | Gly | Leu |
| | | | | 1105 | | | | | 1110 | | | | | 1115 | | | | |
| | GAG | GAG | ATC | GAC | AGG | GCC | TTG | GGA | ATT | CCT | GAG | CTC | GTG | AAT | CAG | GGA | CAA | GCT |
| | Glu | Glu | Ile | Asp | Arg | Ala | Leu | Gly | Ile | Pro | Glu | Leu | Val | Asn | Gln | Gly | Gln | Ala |
| | 1120 | | | | | 1125 | | | | | 1130 | | | | | 1135 | | |
| 30 | TTG | GAG | TCC | AAA | CAG | GAT | GTT | TTC | CAA | GGC | CAA | GAA | GCA | GCA | GTA | ATG | ATG | GAT |
| | Leu | Glu | Ser | Lys | Gln | Asp | Val | Phe | Gln | Gly | Gln | Glu | Ala | Ala | Val | Met | Met | Asp |
| | | | 1140 | | | | | 1145 | | | | | 1150 | | | | | 1155 |
| | CAG | AAG | GCT | GCA | CTA | TAT | GGA | CAG | ACA | TAC | CCA | GCT | CAG | GGT | CCT | CCC | CTT | CAA |
| 35 | Gln | Lys | Ala | Ala | Leu | Tyr | Gly | Gln | Thr | Tyr | Pro | Ala | Gln | Gly | Pro | Pro | Leu | Gln |
| | | | | | 1160 | | | | | 1165 | | | | | 1170 | | | |
| | GGA | GGC | TTT | AAC | CTT | CAG | GGA | | | | | | | | | | | |

1375 1380 1385
AAT GGC TCC TTC CCC CAG CAG CAG TTT GCT CCC CAG GGG AAC CCT GCA GCC TAC
Asn Gly Ser Phe Pro Gln Gln Gln Phe Ala Pro Gln Gly Asn Pro Ala Ala Tyr
1390 1395 1400 1405
5 AAC ATG GTG CAT ATG AAC AGC AGC GGT GGG CAC TTG GGA CAG ATG GCC ATG ACC
Asn Met Val His Met Asn Ser Ser Gly Gly His Leu Gly Gln Met Ala Met Thr
1410 1415 1420
10 CCC ATG CCC ATG TCT GGC ATG CCC ATG GGC CCC GAT CAG AAA TAC TGC TGA CAT
Pro Met Pro Met Ser Gly Met Pro Met Gly Pro Asp Gln Lys Tyr Cys *** His
1425 1430 1435 1440
CTC CCT AGT GGG ACT GAC TGT ACA GAT GAC ACT GCA CAG GAT CAT CAG GAC GTG
Leu Pro Ser Gly Thr Asp Cys Thr Asp Asp Thr Ala Gln Asp His Gln Asp Val
1445 1450 1455
15 GCG GCG AGT CAT TGT CTA AGC ATC CAG CTT GGA AAC AAG GCC AGC GTG ACC AGC
Ala Ala Ser His Cys Leu Ser Ile Gln Leu Gly Asn Lys Ala Ser Val Thr Ser
1460 1465 1470 1475
AGC GGG GTC TGT GCT GTC ATT TGA GCA GAG CTG GGT CTC GCT GAA GCG CAC TGT
Ser Gly Val Cys Ala Val Ile ***
1480 1485 1490 1495
20 CTA CCT GAT GCC CTG CCT CTG TGT GGC AAG GTG TTC TGC CTC ATG AGG ATG TGA
1500 1505 1510
TTC TGG AGA TGG GGT GTT CGT AAG CAC CGC TCT CTT ACG TCA CTC CCT TCT GCC
1515 1520 1525 1530
25 TCG CCA GCC AAA GTC TTC ACG TAG ATC TAG
1535 1540

(2) INFORMATION FOR SEQ ID NO: 10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22
(B) TYPE: nucleic acid
(C) STRANDEDNESS: Single
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

5'-TCCTTTTCCCAGCAGCAGTTTG-3'

(2) INFORMATION FOR SEQ ID NO: 11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
(B) TYPE: nucleic acid
(C) STRANDEDNESS: Single
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

5'ATGCCAGACATGGGCATGGG-3'

(2) INFORMATION FOR SEQ ID NO: 12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1539
(B) TYPE: amino acid
(C) STRANDEDNESS: Single
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

55 Met Ser Gly Leu Gly Glu Ser Ser Leu Asp Pro Leu Ala Ala Glu Ser Arg Lys
40 45 50 55
Arg Lys Leu Pro Cys Asp Ala Pro Gly Gln Gly Leu Val Tyr Ser Gly Glu Lys
60 65 70
60 Trp Arg Arg Glu Gln Glu Ser Lys Tyr Ile Glu Glu Leu Ala Glu Leu Ile Ser
75 80 85 90
Ala Asn Leu Ser Asp Ile Asp Asn Phe Asn Val Lys Pro Asp Lys Cys Ala Ile
95 100 105
Leu Lys Glu Thr Val Arg Gln Ile Arg Gln Ile Lys Glu Gln Gly Lys Thr Ile
110 115 120 125

Ser Ser Asp Asp Asp Val Gln Lys Ala Asp Val Ser Ser Thr Gly Gln Gly Val
 130 135 140 145
 Ile Asp Lys Asp Ser Leu Gly Pro Leu Leu Gln Ala Leu Asp Gly Phe Leu
 150 155 160
 5 Phe Val Val Asn Arg Asp Gly Asn Ile Val Phe Val Ser Glu Asn Val Thr Gln
 165 170 175 180
 Tyr Leu Gln Tyr Lys Gln Glu Asp Leu Val Asn Thr Ser Val Tyr Ser Ile Leu
 185 190 195
 10 His Glu Gln Asp Arg Lys Asp Phe Leu Lys His Leu Pro Lys Ser Thr Val Asn
 200 205 210 215
 Gly Val Ser Trp Thr Asn Glu Asn Gln Arg Gln Lys Ser His Thr Phe Asn Cys
 220 225 230 235
 Arg Met Leu Met Lys Thr His Asp Ile Leu Glu Asp Val Asn Ala Ser Pro Glu
 240 245 250
 15 Thr Arg Gln Arg Tyr Glu Thr Met Gln Cys Phe Ala Leu Ser Gln Pro Arg Ala
 255 260 265 270
 Met Leu Glu Glu Gly Glu Asp Leu Gln Cys Cys Met Ile Cys Val Ala Arg Arg
 275 280 285
 20 Val Thr Ala Pro Phe Pro Ser Ser Pro Glu Ser Phe Ile Thr Arg His Asp Leu
 290 295 300 305
 Ser Gly Lys Val Val Asn Ile Asp Thr Asn Ser Leu Arg Ser Ser Met Arg Pro
 310 315 320 325
 25 Gly Phe Glu Asp Ile Ile Arg Arg Cys Ile Gln Arg Phe Phe Ser Leu Asn Asp
 330 335 340
 Gly Gln Ser Trp Ser Gln Lys Arg His Tyr Gln Glu Ala Tyr Val His Gly His
 345 350 355 360
 Ala Glu Thr Pro Val Tyr Arg Phe Ser Leu Ala Asp Gly Thr Ile Val Ser Ala
 365 370 375
 30 Gln Thr Lys Ser Lys Leu Phe Arg Asn Pro Val Thr Asn Asp Arg His Gly Phe
 380 385 390 395
 Ile Ser Thr His Phe Leu Gln Arg Glu Gln Asn Gly Tyr Arg Pro Asn Pro Asn
 400 405 410 415
 35 Pro Ala Gly Gln Gly Ile Arg Pro Pro Ala Ala Gly Cys Gly Val Ser Met Ser
 420 425 430
 Pro Asn Gln Asn Val Gln Met Met Gly Ser Arg Thr Tyr Gly Val Pro Asp Pro
 435 440 445 450
 Ser Asn Thr Gly Gln Met Gly Gly Ala Arg Tyr Gly Ala Ser Ser Ser Val Ala
 455 460 465
 40 Ser Leu Thr Pro Gly Gln Ser Leu Gln Ser Pro Ser Ser Tyr Gln Asn Ser Ser
 470 475 480 485
 Tyr Gly Leu Ser Met Ser Ser Pro Pro His Gly Ser Pro Gly Leu Gly Pro Asn
 490 495 500 505
 45 Gln Gln Asn Ile Met Ile Ser Pro Arg Asn Arg Gly Ser Pro Lys Met Ala Ser
 510 515 520
 His Gln Phe Ser Pro Ala Ala Gly Ala His Ser Pro Met Gly Pro Ser Gly Asn
 525 530 535 540
 Thr Gly Ser His Ser Phe Ser Ser Ser Leu Ser Ala Leu Gln Ala Ile Ser
 545 550 555
 50 Glu Gly Val Gly Thr Ser Leu Leu Ser Thr Leu Ser Ser Pro Gly Pro Lys Leu
 560 565 570 575
 Asp Asn Ser Pro Asn Met Asn Ile Ser Gln Pro Ser Lys Val Ser Gly Gln Asp
 580 585 590 595
 55 Ser Lys Ser Pro Leu Gly Leu Tyr Cys Glu Gln Asn Pro Val Glu Ser Ser Val
 600 605 610
 Cys Gln Ser Asn Ser Arg Asp His Pro Ser Glu Lys Glu Ser Lys Glu Ser Ser
 615 620 625 630
 Gly Glu Val Ser Glu Thr Pro Arg Gly Pro Leu Glu Ser Lys Gly His Lys Lys
 635 640 645
 60 Leu Leu Gln Leu Leu Thr Cys Ser Ser Asp Asp Arg Gly His Ser Ser Leu Thr
 650 655 660 665
 Asn Ser Pro Leu Asp Pro Asn Cys Lys Asp Ser Ser Val Ser Val Thr Ser Pro
 670 675 680 685
 65 Ser Gly Val Ser Ser Ser Thr Ser Gly Thr Val Ser Ser Thr Ser Asn Val His
 690 695 700
 Gly Ser Leu Leu Gln Glu Lys His Arg Ile Leu His Lys Leu Leu Gln Asn Gly
 705 710 715 720
 Asn Ser Pro Ala Glu Val Ala Lys Ile Thr Ala Glu Ala Thr Gly Lys Asp Thr
 725 730 735 740
 70 Ser Ser Thr Ala Ser Cys Gly Glu Gly Thr Thr Arg Gln Glu Gln Leu Ser Pro
 745 750 755

| | | | | | | | | | | | | | | | | | | |
|----|------|------|-----|------|------|------|------|-----|------|------|------|------|-----|------|------|------|------|-----|
| | Lys | Lys | Lys | Glu | Asn | Asn | Ala | Leu | Leu | Arg | Tyr | Leu | Leu | Asp | Arg | Asp | Asp | Pro |
| | 760 | | | | | | 765 | | | | | 770 | | | | 775 | | |
| | Ser | Asp | Val | Leu | Ala | Lys | Glu | Leu | Gln | Pro | Gln | Ala | Asp | Ser | Gly | Asp | Ser | Lys |
| | | | | 780 | | | | | 785 | | | | | 790 | | | | |
| 5 | Leu | Ser | Gln | Cys | Ser | Cys | Ser | Thr | Asn | Pro | Ser | Ser | Gly | Gln | Glu | Lys | Asp | Pro |
| | 795 | | | | 800 | | | | | | 805 | | | | 810 | | | |
| | Lys | Ile | Lys | Thr | Glu | Thr | Asn | Glu | Glu | Val | Ser | Gly | Asp | Leu | Asp | Asn | Leu | Asp |
| | | 815 | | | | | | 820 | | | | | 825 | | | | 830 | |
| 10 | Ala | Ile | Leu | Gly | Asp | Leu | Thr | Ser | Ser | Asp | Phe | Tyr | Asn | Asn | Pro | Thr | Asn | Gly |
| | | | | 835 | | | | | | 840 | | | | | 845 | | | |
| | Gly | His | Pro | Gly | Ala | Lys | Gln | Gln | Met | Phe | Ala | Gly | Pro | Ser | Ser | Leu | Gly | Leu |
| | | 850 | | | | | 855 | | | | | 860 | | | | 865 | | |
| | Arg | Ser | Pro | Gln | Pro | Val | Gln | Ser | Val | Arg | Pro | Pro | Tyr | Asn | Arg | Ala | Val | Ser |
| | | | | 870 | | | | | 875 | | | | | 880 | | | | |
| 15 | Leu | Asp | Ser | Pro | Val | Ser | Val | Gly | Ser | Gly | Pro | Pro | Val | Lys | Asn | Val | Ser | Ala |
| | 885 | | | | | 890 | | | | | 895 | | | | 900 | | | |
| | Phe | Pro | Gly | Leu | Pro | Lys | Gln | Pro | Ile | Leu | Ala | Gly | Asn | Pro | Arg | Met | Met | Asp |
| | | 905 | | | | | 910 | | | | | 915 | | | 920 | | | |
| 20 | Ser | Gln | Glu | Asn | Tyr | Gly | Ala | Asn | Met | Gly | Pro | Asn | Arg | Asn | Val | Pro | Val | Asn |
| | | | | 925 | | | | 930 | | | | | 935 | | | | | |
| | Pro | Thr | Ser | Ser | Pro | Gly | Asp | Trp | Gly | Leu | Ala | Asn | Ser | Arg | Ala | Ser | Arg | Met |
| | 940 | | | | | 945 | | | | | 950 | | | | 955 | | | |
| | Glu | Pro | Leu | Ala | Ser | Ser | Pro | Leu | Gly | Arg | Thr | Gly | Ala | Asp | Tyr | Ser | Ala | Thr |
| | | 960 | | | | | 965 | | | | | 970 | | | | | 975 | |
| 25 | Leu | Pro | Arg | Pro | Ala | Met | Gly | Gly | Ser | Val | Pro | Thr | Leu | Pro | Leu | Arg | Ser | Asn |
| | | | | | 980 | | | | 985 | | | | | 990 | | | | |
| | Arg | Leu | Pro | Gly | Ala | Arg | Pro | Ser | Leu | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | | 1010 | |
| 30 | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln | Gln |
| | | | | 1015 | | | | | 1020 | | | | | 1025 | | | | |
| | Gln | Met | Leu | Gln | Met | Arg | Thr | Gly | Glu | Ile | Pro | Met | Gly | Met | Gly | Val | Asn | Pro |
| | 1030 | | | | | 1035 | | | | | 1040 | | | | 1045 | | | |
| | Tyr | Ser | Pro | Ala | Val | Pro | Ser | Asn | Gln | Pro | Gly | Ser | Trp | Pro | Glu | Gly | Met | Leu |
| | | 1050 | | | | | 1055 | | | | | 1060 | | | | | 1065 | |
| 35 | Ser | Met | Glu | Gln | Gly | Pro | His | Gly | Ser | Gln | Asn | Arg | Pro | Leu | Leu | Arg | Asn | Ser |
| | | | | | 1070 | | | | 1075 | | | | | 1080 | | | | |
| | Leu | Asp | Asp | Leu | Leu | Gly | Pro | Pro | Ser | Asn | Ala | Glu | Gly | Gln | Ser | Asp | Glu | Arg |
| | 1085 | | | | | 1090 | | | | | 1095 | | | | | 1100 | | |
| 40 | Ala | Leu | Leu | Asp | Gln | Leu | His | Thr | Leu | Leu | Ser | Asn | Thr | Asp | Ala | Thr | Gly | Leu |
| | | | | 1105 | | | | | 1110 | | | | | 1115 | | | | |
| | Glu | Glu | Ile | Asp | Arg | Ala | Leu | Gly | Ile | Pro | Glu | Leu | Val | Asn | Gln | Gly | Gln | Ala |
| | 1120 | | | | | 1125 | | | | 1130 | | | | | 1135 | | | |
| | Leu | Glu | Ser | Lys | Gln | Asp | Val | Phe | Gln | Gly | Gln | Glu | Ala | Ala | Val | Met | Met | Asp |
| | | 1140 | | | | | 1145 | | | | | 1150 | | | | | 1155 | |
| 45 | Gln | Lys | Ala | Ala | Leu | Tyr | Gly | Gln | Thr | Tyr | Pro | Ala | Gln | Gly | Pro | Pro | Leu | Gln |
| | | | | | 1160 | | | | 1165 | | | | | 1170 | | | | |
| | Gly | Gly | Phe | Asn | Leu | Gln | Gly | Gln | Ser | Pro | Ser | Phe | Asn | Ser | Met | Met | Gly | Gln |
| | 1175 | | | | | 1180 | | | | | 1185 | | | | | 1190 | | |
| 50 | Ile | Ser | Gln | Gln | Gly | Ser | Phe | Pro | Leu | Gln | Gly | Met | His | Pro | Arg | Ala | Gly | Leu |
| | | | | | 1195 | | | | 1200 | | | | | 1205 | | | | |
| | Val | Arg | Pro | Arg | Thr | Asn | Thr | Pro | Lys | Gln | Leu | Arg | Met | Gln | Leu | Gln | Gln | Arg |
| | 1210 | | | | | 1215 | | | | | 1220 | | | | 1225 | | | |
| | Leu | Gln | Gly | Gln | Gln | Phe | Leu | Asn | Gln | Ser | Arg | Gln | Ala | Leu | Glu | Met | Lys | Met |
| | | 1230 | | | | | 1235 | | | | | 1240 | | | | | 1245 | |
| 55 | Glu | Asn | Pro | Ala | Gly | Thr | Ala | Val | Met | Arg | Pro | Met | Met | Pro | Gln | Ala | Phe | Phe |
| | | | | | 1250 | | | | | 1255 | | | | | 1260 | | | |
| | Asn | Ala | Gln | Met | Ala | Ala | Gln | Gln | Lys | Arg | Glu | Leu | Met | Ser | His | His | Leu | Gln |
| | 1265 | | | | | 1270 | | | | | 1275 | | | | | 1280 | | |
| 60 | Gln | Gln | Arg | Met | Ala | Met | Met | Met | Ser | Gln | Pro | Gln | Pro | Gln | Ala | Phe | Ser | Pro |
| | | | | 1285 | | | | | 1290 | | | | | 1295 | | | | |
| | Pro | Pro | Asn | Val | Thr | Ala | Ser | Pro | Ser | Met | Asp | Gly | Val | Leu | Ala | Gly | Ser | Ala |
| | 1300 | | | | | 1305 | | | | | 1310 | | | | 1315 | | | |
| | Met | Pro | Gln | Ala | Pro | Pro | Gln | Gln | Phe | Pro | Tyr | Pro | Ala | Asn | Tyr | Gly | Met | Gly |
| | | 1320 | | | | | 1325 | | | | | 1330 | | | | | 1335 | |
| 65 | Gln | Pro | Pro | Glu | Pro | Ala | Phe | Gly | Arg | Gly | Ser | Ser | Pro | Pro | Ser | Ala | Met | Met |
| | | | | | 1340 | | | | 1345 | | | | | 1350 | | | | |
| | Ser | Ser | Arg | Met | Gly | Pro | Ser | Gln | Asn | Ala | Met | Val | Gln | His | Pro | Gln | Pro | Thr |
| | 1355 | | | | | 1360 | | | | | 1365 | | | | | 1370 | | |
| 70 | Pro | Met | Tyr | Gln | Pro | Ser | Asp | Met | Lys | Gly | Trp | Pro | Ser | Gly | Asn | Leu | Ala | Arg |
| | | | | | 1375 | | | | 1380 | | | | | 1385 | | | | |
| | Asn | Gly | Ser | Phe | Pro | Gln | Gln | Gln | Phe | Ala | Pro | Gln | Gly | Asn | Pro | Ala | Ala | Tyr |

| | | | | | | | |
|----|---|------|------|------|------|------|------|
| | 1390 | | 1395 | | 1400 | | 1405 |
| | Asn Met Val His Met Asn Ser Ser Gly Gly His Leu Gly Gln Met Ala Met Thr | | | | | | |
| | | 1410 | | 1415 | | 1420 | |
| 5 | Pro Met Pro Met Ser Gly Met Pro Met Gly Pro Asp Gln Lys Tyr Cys *** His | | | | | | |
| | 1425 | | 1430 | | 1435 | | 1440 |
| | Leu Pro Ser Gly Thr Asp Cys Thr Asp Asp Thr Ala Gln Asp His Gln Asp Val | | | | | | |
| | | 1445 | | 1450 | | 1455 | |
| | Ala Ala Ser His Cys Leu Ser Ile Gln Leu Gly Asn Lys Ala Ser Val Thr Ser | | | | | | |
| | 1460 | | 1465 | | 1470 | | 1475 |
| 10 | Ser Gly Val Cys Ala Val Ile *** | | | | | | |
| | | 1480 | | 1485 | | 1490 | |
| | | | | | | | 1495 |